

FUNCTIONAL PEDAGOGY  
FOR  
VOCATIONAL TEACHERS

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Short-Term Training Course in Pedagogy for Untrained Teachers of the Vocational Course in the Repair and Maintenance of Electrical Appliances held at the Regional College of Education, Mysore from May 15 - June 4, 1986

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## INTRODUCTION

Vocationalisation of post-secondary education which is looming large on the horizon of educational reconstruction in the wake of the New Educational Policy represents a major transformation of the educational system. Through vocationalisation of education is sought the establishment of most vital links between school and work, education and productivity, education and employment, and education and national development which includes rural, industrial, economic and human resource development. It is because of the above perceived benefits of vocationalisation of education that high priority is to be attached to it in the 7th and 8th Five Year Plans according to the New Educational Policy which stipulates ten per cent coverage of students at the higher secondary level in vocational courses by 1990 and twenty five per cent by 1995.

Crucial in the successful implementation of the programme of vocationalisation, as in any other programme of educational reconstruction, is the role of the class-room teacher whose ultimate responsibility it is to translate a programme into concrete reality. However, teacher preparation for vocational courses at the +2 level has not received the attention that it deserves with the result that a majority of teachers teaching vocational courses are ill-prepared for their demanding tasks which assume far greater complexity because of the more exacting combination of practical vocational skills, theoretical knowledge and teaching competence required for their proper performance.

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As regards the present teaching arrangements for teaching vocational courses, different modes of teacher employment are in vogue in different parts of the country. While some states have employed teachers from the erstwhile multi-purpose scheme or bifurcated courses, some others are making use of the existing subject teachers or appointing fresh graduates/polytechnic diploma holders/post graduates for this purpose. Employment of part-time teachers including skilled workers/professional experts has also been resorted to in a number of States as full-time teachers who can impart practical training in the needed vocational subjects are just not available. It goes without saying that the above categories of teachers are badly in need of appropriate training so that they can do their jobs effectively. While the existing teachers of Science, Commerce, Home Science, etc. require intensive practical training in corresponding vocational subjects, the part-time teachers of vocational courses who are fresh-graduates/post-graduates without any practical training in the vocations as also the requisite pedagogical preparation need to be given both. Besides these, training packages in communication skills, psychology of adolescence, sociology of education and principles and methods of teaching and evaluation are required.

However, in spite of the urgent need for the in-service education of teachers for vocational courses, most of the States which have introduced vocationalisation of education have not yet designed any systematic programme for it. The result is that most of the vocational teachers do not possess the requisite theoretical knowledge,



practical competence and pedagogical skills for the effective teaching of vocational courses. It is in this context that inservice training courses for vocational teachers assume special importance as a means of updating the knowledge base, developing the vocational skills and abilities, and providing proper pedagogical preparation.

With the above end in view, the Department of Vocationalisation of Education, N.C.E.R.T. has been organising short-term training courses for vocational teachers of different states during summer vacation. The present training course for untrained teachers of Andhra Pradesh, Karnataka, and Tamil Nadu in the Maintenance and Repair of Electrical Appliances is a part of this larger programme and is second in the series on pedagogy. However, this training course has several distinct features. Firstly, it is a package programme of teacher education and is aimed at imparting the functional and most essential aspects of pedagogy in general and the pedagogy of the Electrical Appliances Course, in particular. The course is designed to acquaint the teachers with the psychology of teaching-learning as also suitable methods for it against the socio-economic-cultural background and goals of the Indian society. Secondly, the course combines theoretical discussion with sufficient practical work needed for developing general teaching skills as also special skills for teaching the technology of Electrical Appliances. Thirdly, it is the most comprehensive short-duration integrated course by using which a large number of untrained teachers can be trained in a very short-time by a variety of agencies concerned with vocational education as also teacher-training colleges.

Lastly, the programme can serve as a model for developing condensed but integrated courses for other vocational areas. Given below are the specific objectives of the course.

1. To help the untrained teachers of Electrical Appliances Course develop an understanding of the objectives of school education in the Indian context and an awareness of the role of the school in achieving the goals of building up a modern democratic, secular and socialist society.
2. To help them understand the specific objectives of vocational courses such as meeting diverse abilities and interests of students, greater productivity and employability, economic and rural development, reduction in social disparities and so on.
3. To help them perceive their role as guides and agents of social change and as leaders of children.
4. To help them develop competence to teach the vocational subject of their specialisation on the basis of accepted principles of learning and teaching and in the context of total school curriculum.
5. To develop in them the skills for identifying, selecting, innovating and organising appropriate vocational experiences for teaching the subject of their specialisation.
6. To develop in them an understanding of the bio-psycho-social needs of adolescents, the problems arising out of their non-fulfilment, and the ways in which these needs can be met.
7. To help them understand and appreciate the significance, philosophy, programme, problems and proposed targets of vocationalisation in this country.

This course is being organised by the Department of Vocationalisation of Education, NCERT, New Delhi with the active help and cooperation of the Regional College of Education, Mysore. While the State Governments of Karnataka, Andhra Pradesh and Tamil Nadu have very kindly

deputed their teachers and the Karnataka Directorate of Vocational Education has extended the needed help, the Regional College of Education, Mysore has very kindly provided the venue, made boarding-lodging arrangements for participants and also provided other facilities for the organisation of the course. On behalf of the Department of Vocational Education, NCERT and on my personal behalf, I thank the concerned Directorates of (Vocational) Education in the three states and the Principal, RCE, Mysore for extending unstinted help and cooperation for the organisation of this training course and for making it a success.

In the pages that follow, papers on important topics of discussion and practical work undertaken in the training course are given alongwith important details of the training course. Also included are recommendations made by the teachers for the improvement of education in the Repair and Maintenance of Electrical Appliances Course and for the betterment of their working conditions and professional status. I take this opportunity to thank the resource persons for their painstaking labour in the preparation of highly useful papers and the trainees for their very active and enthusiastic participation in the course.

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VOCATIONALISATION OF EDUCATION-ITS CONCEPT, OBJECTIVES  
AND ESSENTIAL FEATURES

Dr.(Mrs) S P Patel  
Professor

Vocational education is primarily concerned with preparation for work which man undertakes to earn a livelihood and satisfy his material and work needs. Work here refers to productive work which is of positive use to the society. Vocational education is the act of transmitting theoretical knowledge, practical skills, positive attitudes, habits and values in respect of vocations so that the learner can perform work upto acceptable standards and earn a decent living.

UNESCO in its 1974 recommendation defined vocational education as a comprehensive term which includes:

1. General education.
2. Study of technologies and related sciences.
3. Acquisition of practical skills, attitudes, understandings and knowledge related to occupations in various sectors of life.

Thus general education is (a) an integral part of vocational education, <sup>which is</sup> (b) not only a means of preparing youth for an occupational field, but also for life-long education. Further, Vocational education is not mere technician training, but education in the broader sense of the term and is aimed at the total development of the learner with particular emphasis on vocational knowledge and competence. The broad objectives of vocational education as set out by UNESCO are: (1) greater democratisation of the society, (2) greater economic, social and cultural development, (3) greater understanding of the scientific and technological aspects of the modern society, (4) development of the individuals' capacity for significant contribution to national life, and (5) greater capacity for action in such a society.

Vocational education is designed to prepare skilled personnel for various areas of production and services. It is aimed at enabling its recipients to engage in gainful employment including self-employment. It is especially appropriate for those who have neither the interest nor the ability for pursuing studies of an academic nature and for those who wish to acquire jobs immediately after education. For such youth, suitable preparation is needed for work in the industry, on the farm, in the office, at home, or wherever they can be useful to the society. Some most important objectives of Vocational education are given below:-

1. To ensure optimum development of human resources by educating and training youth for work in accordance with their aptitudes, abilities and interests.
- 2(a) To develop occupational competence among youth so as to ensure a steady flow of skilled workers in existing and emerging areas.
- (b) To correct the mismatch between the supply and demand of labour by training youth for middle-level jobs for which there is huge demand but little supply.
3. To link education with productivity and increased production of goods and services through systematic training of youth.
- 4(c) To increase the employmentworthiness of Vocational passouts and to develop their capacity for self-employment by placing adequate stress on entrepreneurship training.
- (b) To prevent unemployment among the educated youth by equipping them for suitable middle-level jobs.
5. To promote the overall economic development of the country by supplying well-motivated and well-trained workers to man diverse jobs in diverse fields.
6. To accelerate rural development by training manpower for those vocations which have the potential for better utilization of agricultural resources.
7. To reduce the excessive and wasteful pressure on university education by diverting a sizeable number of students at the +2 stage to vocational course.

#### SOME ESSENTIAL REQUIREMENTS OF VOCATIONAL COURSES

1. Vocational education is essentially education in the broader sense of the term. It cannot be equated with technician training. It should include general education of good quality with specific training in skills.
2. It trains workers for middle-level jobs which are crucial for increasing productivity and improving services.
3. Practical work and training are very important for Vocational education. Vocationalisation of education should aim at developing a prescribed level of skill commensurate with actual job requirements.
4. The basis of Vocational education should be acquisition of skills and competence in production processes and work conditions nearly identical to those obtaining in work places.
5. Vocational education should be need-based so that it is possible for trained persons to get absorbed in gainful occupations or self-employment.
6. Vocational education should have a good deal of flexibility. The nature and content of Vocational education and skills should constantly be adjusted to new developments in technology and economy.



7. Scientific methods and forms should be adopted for the training and development of skilled personnel.
8. In order to make the vocational courses popular and to imbue them with democratic character, provision of upward mobility i.e. choices for further educational and professional advancement of those undergoing them must be ensured. In the absence of provision for constant progress of their recipients, these courses will lose their credibility.



## VOCATIONALISATION OF EDUCATION IN INDIA -ITS Present Position & Future Directions

Dr (Mrs) S P Patel  
Professor.

### Historical Background

Highly dissatisfied with the academic and bookish character of education in the country, various commissions and committees on education have from time to time recommended the diversification of courses at the secondary stage by introducing vocational courses of a wide variety in consonance with diverse aptitudes, abilities and inclinations of students. The Mudaliar Commission (1952) was of the view that the secondary stage of education is a complete stage by itself and after completing it, the student should be in a position to take up some vocation and enter into the responsibilities of life. As a result of this recommendation, multi-purpose schools providing diverse courses catering to diverse student abilities and needs were started all over the country. However, due to various lacunae such as too early specialisation after Class VIII, limited number of Vocational courses, overburdened curricula, substandard infrastructural facilities, lack of provision for admission into university courses and the lack of public acceptance, multi-purpose schools could not make much headway. Then came the Kothari Commission in 1964-66 which recommended that school education should consist of twelve years instead of 11 years to ensure better quality or higher standards of education which should be comparable to international standards.

Taking serious note of the mad rush for universities, the commission recommended that in addition to the academic stream of education, a vocational stream of education with a variety of courses from different areas should be started and at least half the number of students desiring higher secondary education should be diverted to it in order to prevent this rush. Further, the Vocational courses were to be terminal in nature as well as leading to higher education after adequate experience of work had been acquired by the students. Such courses were intended to train skilled manpower needed to manage crucial middle-level jobs in rural and urban areas.

The National Policy Resolution (1968) accepted the above recommendation of the Kothari Commission and entrusted to the NCERT the task of preparing curricula for such courses and also helping the states in the implementation of Vocational education.

### Present Position

Consequent upon the acceptance of the recommendations of the Kothari Commission, programmes for the Vocationalisation of higher secondary education in the 10+2 pattern of school education were initiated in the year 1976 by some states. Upto 1979, six states and two union territories had introduced the programme in different degrees. To date, eleven States and five union territories viz. Andhra Pradesh, Assam, Gujarat, Haryana, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal, Andaman and Nicobar Islands, Chandigarh, Delhi, Goa, and Pondichery have introduced Vocational Courses in agriculture, technology, commerce, home-science, para-medical and miscellaneous areas. Besides, Bihar, Orissa, Himachal Pradesh, Madhya Pradesh and Punjab are making preparations for the introduction of Vocational courses.

At present, more than 115 Vocational courses in six areas as mentioned above are being offered in different States/ Union Territories in the country in higher secondary schools or Junior/Intermediate Colleges. Their management is in the hands of different agencies in different states such as the Boards of Technical Education/Secondary Education/Higher Secondary Education/Intermediate education or the Departments of Education which discharge administrative or academic responsibilities or a combination of both. In some States, recognition has been given to the certificates of Vocational courses by appropriate agencies and recruitment rules have been revised to make it possible for graduates of Vocational courses to get jobs in the organised sector. Also a certain percentage of seats have been reserved in some states for the admission of products of Vocational courses to universities and institutions of professional education. The total enrolment in Vocational courses at the moment is about 1.5 lakh and the number of institutions imparting Vocational Education at the higher secondary stage is above 1900. Some significant steps taken for the promotion of Vocationalisation of education in the country are given below :-

1. An all India Board of Vocational Education has been set up under the All-India Council for Technical Education.
2. An inter-ministerial national level Steering Committee for implementation of the programme of Vocationalisation is in operation.

3. An apprenticeship scheme by the Ministry of Education offering scholarships of Rs.200/- per month for six months to 3000 vocational students per year is in operation.

#### Problems and Challenges before Vocationalisation of Educations

1. The programme of Vocationalisation of education was started in 1976. But it has made very slow progress. It still remains to be introduced in 11 out of 22 states and three out of nine Union territories. Even in States where it has been introduced, its coverage is by and large not enough.
2. The public at large has generally remained apathetic to the programme. There is greater preference for academic education leading to white collar jobs.
3. Finances for the programme are grossly inadequate, Vocationalisation of education is by its very nature more expensive as it needs at least a modicum of necessary equipment and materials for practical work. In the absence of central assistance which stopped in 1979, the states have not been able to allocate adequate resources to the programme.
4. Lack of proper administrative structures and teacher training has seriously hampered the progress of Vocationalisation. In the absence of teachers possessing both theoretical knowledge and practical competence for teaching Vocational courses, the quality of Vocational Education has suffered.
5. There is a serious lack of suitable teaching-learning and audio-visual materials for Vocational Courses. In the absence of these materials, teachers have to depend upon their own notes, which are very often not upto the work.
6. In many states, certificates and diplomas of Vocational courses have not been recognised by appropriate agencies, making it difficult for their holders to get jobs or admission into institutions of higher learning. Lack of upward mobility for Vocational graduates has thus lowered the popularity of these courses.
7. Lack of employment opportunities for Vocational graduates - both wage and self-employment - has seriously detracted from the credibility of these courses. Unless the relationship between vocational education and actual employment opportunities is strengthened, Vocational education will not assume high stature.

#### Vocational Potential of Different Sectors/Areas:

The country has made giant strides in several areas of economy ever since the attainment of independence nearly four decades ago. Amongst the developing countries, India occupies an important place so far its agricultural and industrial as

development is concerned. Industrial growth and development combined with significant advances in science and technology has resulted into the emergence of a multitude of occupations unheard of before in which the needs of trained manpower are immense and will further grow. The country is further poised for significant progress in the Seventh Plan in which the priorities and strategies of development are expected to undergo important changes aimed at bringing about more accelerated agricultural and industrial development resulting into greater trade and commercial activity.

Broad areas of industry, technology, activities and services in which vocational courses need to be instituted are building construction, electrical, electronics, Mechanical, chemical, petroleum, textile, garment-making, food and catering, leather and footwear, health and para-medical, management and secretarial services, import and export, banking and insurance, agro-industries and cottage industries, home science and home economics, plastic and performing arts, transport and communication education and social welfare, and so on. It is thus obvious that labour intensive industry and trade have the highest potential for providing varied avenues of gainful employment to the products of vocational education. This potential should be properly identified and necessary personnel trained for it.

#### Role of the NCERT And The States In The Vocationalisation of Education

The Vocationalisation of education programme assumes added complexity since it requires the collaboration and co-operation of a multiplicity of agencies working at different levels- Central, State and Local. At the central level, the Ministry of Education, Govt. Of India looks after the programme, frames policies, provides guidelines and other assistance to the States for its introduction and expansion. The academic support for the programme is provided by the NCERT which has been its custodian ever since its inception. Within the NCERT, the Department of Vocationalisation of Education has been entrusted with the task of advising the Ministry of Education, Govt. of India on all aspects related to Vocationalisation of education and also undertaking the needed research, development, training and dissemination programmes in this regard. The Department

organises national level conferences and seminars on the subject, training courses for Vocational teachers to update their Vocational knowledge and professional competence, orientation courses for key educational planners, administrators, training college and school personnel, develops minimum competency-based curricula and instructional materials for vocational courses, conducts research studies and disseminates related information.

The State Governments conduct Vocational surveys for the selection of appropriate Vocational courses, design and develop Vocational curricula and instructional materials, select schools and collaborating institutions and enterprises, provide necessary infrastructural facilities to the schools, identify select and prepare whole-time and part-time teachers for Vocational courses, make efforts for the recognition of Vocational courses and job placement of the Vocational graduates and perform all other functions which are necessary for the promotion of Vocationalisation of education in their jurisdiction.

While at the national level, a National Board of Vocational Education has been created under the All India Council for Technical Education, at the State level, the State Councils and State Boards of Vocational Education have been visualised. At present, the Departments of Education/Intermediate Education/Technical Education and Boards of Higher Secondary/Secondary Education are performing the academic and administrative functions related to Vocationalisation of Education and more than 1,35,000 students and 1900 institutions are involved in it.

Apart from higher secondary schools/junior/intermediate colleges providing Vocational courses at the post-second stage, eighteen types of institutions are providing Vocational education. These institutions are :-

1. Polytechnics.
2. I.T.Is.
3. Junior Technical Schools.
4. Crafts & Handicrafts Schools.
5. Industrial and Technical Schools.
6. Agricultural Schools.
7. Forestry Schools.
8. Veterinary and Animal Husbandry Schools.
9. Nursing and Health Visitor Schools.
- 10 Pharmacy Schools.

11. Other Para-Medical Schools.
12. Schools for Training in Co-Operation.
13. Commercial Training Schools.
14. Schools for Village-Level Officials.
15. Fishery Schools.
16. Schools for Music, Dance and Drama.
17. Schools for Drawing & Painting.
18. Other Schools.

In 1973, while 40.7% enrolment in these institutions was in courses parallel to the higher secondary stage, 48.7% was in courses parallel to Post higher secondary level courses. Two fifths of those enrolled in these institutions were getting instruction parallel to higher secondary level vocational courses.

#### Need For Co-ordination

The above institutions are under the administrative control of different agencies such as the Nursing Council, the Pharmacy Council and the Dental Council of India in respect of para-medical schools; the Indian Council for Agricultural Research for agricultural institutions, the All India Council for Technical Education at the Centre and State Boards of Technical Education in the States for polytechnic education, the Directorate of Employment and Training in the Ministry of Labour for the I.T.I. and so on. All these institutions work in isolation. For the success of the programme of Vocationalisation, a most important requirement is to bring about co-ordination and co-operation among all these agencies which in turn will bring about/wasted-ness of effort and expenditure. Equally essential is co-operation between the Vocational agencies/institutions working at the post-secondary level and business enterprises, factories, farms and industry.

#### Recent Developments

At the threshold of the VII plan, a Working Group was appointed by the Government of India to consider objectives and programme for secondary education during the VII plan period. Recommendation made by this workshop group for the promotion and vocationalisation in the coming years relate to:



1. Making Vocationalisation of Education a centrally sponsored scheme and providing necessary financial inputs to it.
2. Amendment of the Apprenticeship Act to cover students of the +2 Vocational stream.
3. Setting up of model +2 Vocational institutions in demonstration schools of the NCERT and selected Kendriya Vidyalayas.
4. Introducing 2-year certificate-level Vocational courses in Polytechnics.
5. Ascertaining the manpower needs of different industries and public sector undertakings and utilising their facilities for providing Vocationalisation of education.
6. Strengthening administrative and academic structures concerned with Vocationalisation of education at the national and State levels.
7. Making intensive efforts for the revision of Vocational curricula and instructional materials for the existing and emerging vocations.
8. Starting vocational courses in 400 schools in every year of the 7th plan.
9. Providing greater academic support to the States such as Vocational curricula, instructional materials, teacher training, management techniques and so on.

A National Working group on Vocationalisation of Education set up by the All India Council for Technical-

Education Submitted its report (Kulindaiswamy Report) in August 1985 after fully considering the need for vocationalisation and its existing position. Important recommendations of this working group for the higher secondary stage are given below :-

1. The programme of vocationalisation should be kept flexible in view of such unfavourable factors as social prejudices, resistance to change and vaguely defined job requirements.
2. The components of the curriculum for vocational education are language(s), related subjects and foundation courses, vocational theory and practice. There cannot be any uniform prescription of weightages for these components. However, there should be broad uniformity in essential aspects. The guiding principle in developing the content of vocational courses should be the development of desired competencies, ensuring the employability of the vocational passouts and increase in individual and corporate productivity.
3. Nearly 2.4 lakh students in the higher secondary stream for 10% diversion by 1990 and 6.9 lakh students for 25% diversion by 1995 should be covered by the proposed vocationalisation programme in addition to the present 60,000 students.
4. The vocational courses should be selected on the basis of properly conducted vocational surveys and should be need-based or relevant to economic life in the region, district or city.
5. Duplication of courses such as those in TTIs and Polytechnics should be avoided. Many areas in agriculture, health, paramedical services, home science, humanities, service-areas in engineering and technology and business and commerce in which TTIs and polytechnics are not involved may be selected for vocational courses.

6. Laboratory facilities available in schools or those which can be procured with marginal financial inputs should be taken into account while deciding on vocational subjects. Vocational programmes should make optimum use of the institutional, industrial and organisational facilities available in the neighbourhood.
7. Relevant sections of the community in general must be intimately involved in the formulation and implementation of vocational courses.
8. a) Opportunities for further education in chosen areas of vocational specialisation should be available for 10-15 percent of vocational stream products on the basis of merit.
- b) New diploma level courses may be instituted for the products of higher secondary vocational stream.
- Ten percent of c) The present students of certificate-level vocational courses both within and outside the school system should be able to benefit from diploma and degree level vocational education courses in existing or new areas.
- d) In degree level course, more than one vocational elective as recommended by the U.G.C. may be provided. Full employment-oriented degree level courses in vocational subjects may be offered at the university level.
- e) The present provision of admitting products of higher secondary vocational stream in existing degree level courses may be continued and similar provision may be made in vocational courses also. Bridge courses may be provided for educational mobility between work and further education.
- f) Modular approach and credit system should be adopted to solve the problem of vertical and horizontal educational mobility.
9. a) The structure of management system should have five levels of hierarchy. These are: (1) national, (2) regional, (3) state, (4) district, and (5) institutional. It should also have four types

of institutions according to functions viz. (1) the policy making and coordination bodies, (2) research, development and teacher training institutions, (3) the ministries and directorates for over-all administration, and (4) the examination boards (secondary and higher secondary).

b) At the national level, an All India/Joint Council of Vocational Education and a Bureau of Vocational Education in the Ministry of education may be set up. At the state level, a State Council of Vocational Education and a State Board of Vocational Education besides a State Department of Vocational Education may be set up.

c) The NCERT, the RCE's, the TTTI's the SCERT'S and the Regional Boards of Apprenticeship Training may be strengthened and a frame-work of coordination among these organisations must be established.

d) There should be district level coordination/advisory committees for vocational education and training.

10 a) The development of textbooks and other instructional materials should be undertaken on a large scale.

b) Both full-time and part-time teachers from industries, employment sector and expert institutions should be utilised.

c) Community resources including part-time teachers and training facilities of industries, etc should be fully utilised.

d) A systematic staff training and development programme should be taken up.

e) To begin with, one full-time teacher for each class besides a part-time teacher and an assistant should be utilised.

f) Apprenticeship Act should be amended to cover about 70% of the products of Higher Secondary vocational stream.

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g) A great deal of public support and cooperation will be needed for the success of vocational education programme. Local initiative and participation and sharing of responsibility by the community are a must for this purpose.

11. The role of the Government of India is to provide:

- a) Policy guidelines.
- b) Research and developmental support.
- c) Full financial assistance for some schemes and partial assistance for achieving prescribed targets.
- d) Enacting suitable legislation, where needed.

12. Recruitment rules should be modified to enable vocational passouts to compete for posts in government departments and public sector undertakings.

A National Seminar on Vocationalisation of education was organised by the department of Vocationalisation of Education, MERT in November 1985 in connection with the national debate on educational policy. The seminar by and large endorsed the recommendations of the National Working Group (1985) and in addition, made the following :-

1. Social acceptance of the programme may be enhanced by providing more opportunities for educational and occupational mobility and various incentives such as stipends, scholarships, etc.
2. Specially designed vocational courses based on the needs of rural, tribal, and urban poor may be introduced
3. On-the-job training may be made obligatory for all economic organisations of a minimum size. Industrial and business organisations should adopt educational institutions for providing on-the-job training.
4. Terminality does not mean the end of all education for vocational students. It should be interpreted to mean development of entry level-skills for employment.
5. The duration of vocational courses may vary according to the level of competence needed for employment/self employment.

6. Sufficient incentives should be provided by banks and other financial institutions to vocational students in self-employment ventures. Small-scale Industries Department should assist them with project designs and in setting up their own enterprises.
7. For vertical mobility at the Tertiary level, diploma and special degree courses in vocational areas should be introduced.
8. The Programmes of vocational education should be coordinated through a single agency and managed through a unified system in terms of administration, R & D support, examination and accreditation, etc, both at the central and state levels.
9. The funds for vocational education should be mobilised from a variety of untapped sources such as educational cess, levy on imports and consumer goods. The financing of the programme should be shared between the centre and the states. In addition, financial assistance from the world bank should be sought for the programme.

After a year-long country-wide debate on the National Education Policy, the Indian Parliament passed the National Policy in May 1986. Accordingly, the following will be the salient features of the NEP in respect of vocational education which has been considered crucial in the reorganisation of education :-

1. The introduction of vocational education should be systematic and well-planned and its implementation should be rigorous,
2. Vocational Education will be a distinct stream. It will ordinarily be provided at the higher secondary stage, but it may also be introduced after class VIII.
3. Vocational education will be the responsibility of the government, private and public sector employees. The government will, however, take special steps for the vocational education of women, rural and tribal students and other deprived sections.

4. Vocational graduates will be given opportunities under predetermined conditions for professional growth, career development and lateral entry into courses of general, technical and professional education through bridge courses.
5. Need-based and flexible programmes of N.F. vocational education will be made available for school dropouts, women, neoliterates, unemployed, partially employed and those employed in poorly-paid jobs.
6. Vocational courses should also be provided at the university level for graduates of the higher secondary academic stream.
7. Ten per cent of higher secondary students by 1990 and 25% by 1995 should be covered under the programme of vocational education.
8. Steps will be taken to provide employment/encourage self employment among vocational passouts. Recruitment rules will be modified for this purpose.

## EDUCATION, INSTRUCTION AND TRAINING

Dr. D D Yadav  
Lecturer.

Education is as old as the human race. It has different meaning for different group of people. Some groups of people conceive it broadly while some conceive it narrowly. The word education has a very wide connotation. A biologist, a priest, a psychologist, a philosopher, a statesman, a teacher, a merchant, a shopkeeper and even an artisan, - all of them supposed to be having intelligence will give widely different definitions. They define it by their own outlook on life, developed through the training they had and the circumstances they were in. Before analysing some of them, the etymological explanation of education will not be out of place.

### I. Etymological or derived meaning of education

Etymologically, the term 'Education' has a number of derivations. According to one view Education is derived from the Latin word 'educare' which means 'to bring up' or to 'nourish'. It means that the child is to be brought up keeping in view certain aims and ideals. According to another view, the term Education is derived from the Latin word "educere" which means 'to lead out' or 'to draw out'. In other words, education is to lead out or to draw out the best in the child and man. According to third view, the term Education is derived from the Latin word "Education" which means the act of teaching and training.

Thus etymologically, "Education is an act of teaching and training to draw out or lead out the best in the child and man, thus to bring him up keeping in view some aims and ideals."

### II. The Indian Concept of Education.

Some important views regarding education held by Indian thinkers are as follows :

1. Rig Veda : Education is that "Which makes a man self-reliant and selfless."
2. Upanishads : "Education is that whose end product is salvation".
3. Aurobindo : "Helping the growing soul to draw out that is in itself".



4. Gandhi : " By education, I mean an all round drawing out of the best in child and man-body, mind and spirit."

5. Definition given by the University Education Commission : (The Radhakrishnan Commission)

"Education according to Indian traditions is not merely a means of earning a living, nor is it only a nursery of thought or a school of citizenship. It is an initiation into the life of spirit, practice of virtue. It is a second birth". According to the Indian concept, " Education is that which emancipates us."

III Western Concept of Education :

Some of the most popular views of western educational thinkers are as follows :

1. Socrates : "Education means the bringing out of the ideas of universal validity, which are latent in the mind of every man"
2. Froebel : "Education is a process by which the child makes its internal external."
3. Kant : "Education is the development in the individual of all the perfection of which he is capable."
4. Pestalozzi : "Education is a natural, harmonious and progressive development of man's innate powers."
5. Redden : "Education is the deliberate and systematic influence exerted by the mature person upon the immature.. through instruction, discipline and harmonious development of physical, intellectual, aesthetic, social and spiritual powers of the human being, according to individual and social needs and directed towards the union of the enucand with his creator as the final end."

Thus according to Western Concepts, "Education is an act of all round development of personality keeping in view the individual and social needs."

### Conclusion :

(1) Education is used both in the narrow and broader senses. In the narrow sense, education refers to schooling where all the aspects of education become formal and the society transmits its cultural heritage, values and skills to the next generation. In the broader sense, any act or experience which has influenced any aspect of the personality of an individual can be called education. Thus education, in the broad sense, is a life long process.

(2) Education is also thought of as a process of acquisition of knowledge and in the more narrow sense, as an act of training.

(3) According to Indian traditions, it is a force of liberation ("Education is that which emancipates us").

(4) 'Education' is used to refer both to a process and to a product. As a product, 'Education is the sum total of what is received through learning - the knowledge, skills, ideals that are the outcomes of learning, as a process, it refers to the act of developing these in the individuals.

Thus 'Education' is a complex concept. It may refer to formal schooling or to the life long process of learning from experience. It has been variously viewed as acquisition of knowledge (also attitudes and skills), transmission of culture, drawing out and developing the best potential, disciplining, moulding the personality, and liberation or emancipation.

### Training :

Education is a conscious purpose to train the children for fulfilling the responsibilities of adult life. Training refers to the development of specific skills or modes of thought which are to be exercised in relation to particular ends or functions in accordance with the rules of such modes of thought or activity. One of the aims of education is inculcation of

vocational skills among individuals. To fulfil this aim, the help of training is a must. A skill is not by its very nature something that would be learnt by reading books or by instruction alone. Books only serve as helpful guides for practice. What is essential for skill learning is constant practice, especially under the guidance of a skilled performer. Training, however, does not restrict itself to the learning of skills. An individual needs training to use his own reason so that he may learn to lead an orderly or moral life. Education is also the training of the eye and the mind so that the individual should make responses to the problems and opportunities of life around him. These responses should be on two levels - mental and physical while physical responses will lead to training in skills, proper mental responses will indicate changes in attitudes of the individual.

### Instruction :

The field of education which means allround development of the child is wide. But the field of instruction is narrow. Instruction means to impart knowledge of specific subjects through teaching. In this way, instruction is used for mental development which is merely one aspect of development.

Acquisition of knowledge, that is, factual information is also an important aspect of personality development. Instruction involves communication by the teacher to structure relevant experiences for the learner. Good instruction would invariably be geared to the child's stage of conceptual development. Good instruction makes use of the child's first hand experience. During instruction, the teacher should ask relevant and creative questions in such a way that sufficient mental development of the child takes place.

GENERAL AIMS & OBJECTIVES OF EDUCATION IN INDIA

Dr. D. D. Y. P. W.  
Lecturer.

Introduction

Our country has attained independence after centuries. After attaining independence, our democratic government, educationists, philosophers and social reformers experience the necessity of formulating new aims of education in order to base education on Indian culture. At the present juncture, social, political and economic conditions of India are changing fast and new problems are coming up. It becomes necessary to re-examine carefully and re-state clearly the aims of education.

We will discuss the aims of education in Modern India as suggested by Secondary Education Commission (1952-53) and Kothari Commission (1964-66), and New Education Policy (1986)

I) Aims of Education According to Secondary Education Commission

(i) Development of Democratic Citizenship

Citizenship in democracy is a very challenging responsibility for which every citizen has to be carefully trained. It involves many intellectual qualities to be developed such as :

(a) Clear thinking : Education should aim at developing capacity for clear thinking and receptivity of new ideas so that one may have the understanding and intellectual integrity for truth, facts and unbiased etc.

(b) Clearness in speech and writing : With clarity of thought is needed clearness in speech and writing for free discussion, persuasion and peaceful exchange of ideas.

(c) Art of living with the community : Education should make the individual learn to live with others. Qualities necessary for living graciously, harmoniously and efficiently such as discipline, cooperation and tolerance etc. Should be developed through education.

(d) Sense of true patriotism : Another aim which education must foster is the development of a true sense of Patriotism and an individual should appreciate sincerely the social and cultural achievements of the nation, he should be ready and frank to recognise its weakness and should be willing to serve the nation to the best of his ability and should subordinate his own interest for broader national interest.

(ii) Improvement of Vocational Efficiency :

The second important aim of our educational system should be to increase the productive, technical and vocational efficiency of our students. This includes the following :

(a) New attitude to work : We should create in the pupils a new attitude for work, an attitude which implies an appreciation for dignity of labour.

(b) Promotion of technical skill : With the development of new attitude of work, there is need to promote technical skill and efficiency at all stages of education so as to provide trained and efficient personnel to work in this technical age.

(iii) Development of Personality : The third main aim of education system is the development of personality which includes :

(a) Releasing the sources of creative energy in the students so that they may be able to appreciate their cultural heritage.

(b) Cultivating rich interests which they can pursue in their leisure and contribute in later life, to the development of this heritage.

(c) Giving a place of honour to the subjects like art, crafts, music, dancing and to the development of hobbies.

(iv) Development of the Qualities of Leadership :

This is important for successful functioning of democracy. Education must train our students for discharging their duties efficiently. They must be trained in the art of leading and following others. Our education must train persons who will be able to assume the responsibility of leadership in social, political, industrial or cultural fields in their own small groups of community or locality.

II) Aims of Education According to Kothari Commission :

Kothari Commission observed, "No reform is more urgent than to transform education, to endeavour to relate it to the life, needs, aspirations of the people and thereby make it a powerful instrument of social, economic and cultural transformation necessary for the realization of our national goals. For this purpose Kothari Commission has suggested the following aims of education :

i). The Commission strongly emphasised the generation and utilization of immense resources of the country. Education should aim at increasing productivity, by linking education and productivity through the development of following programmes :

(a) Science Education, Should become an integral part of school education.

(b) Work-experience, Should be introduced as an integral part of all education - general or vocational.

(c) Application of science to productive process : Every effort should be made to link programmes realistically to technology, to industrialization and to the application of science to productive processes.

(d) Vocationalization : Secondary education should be largely vocationalized and in higher education, a greater emphasis should be placed on agricultural and technical education.

ii) Achieving social and national integration

Achievement of social and national integration, according to Commission, is an important objective of educational system because it is the basis for strong and united country. To strengthen this following steps should be taken :

(a) Common school : At present good education is available only to a small minority which is usually selected not on the basis of talent but on the basis of capacity to pay fees. According to Commission, "If the educational system is to become a powerful instrument of national development in general, we must move towards the goal of a common school system of public education - which will be open to all children, irrespective of caste, creed, religion, economic conditions of social status."

(b) Social and national service : The present educational system is also responsible for increasing gulf between the educated and the uneducated classes, between the intelligentsia and the masses. In order to remove this evil, some form of social and national service should be made obligatory for all students. This can become an instrument to build character, improve discipline, inculcate faith in the dignity of manual labour and develop a sense of social responsibility.

(c) Development of an appropriate language policy

(d) Promotion of national Consciousness : It should be an important objective of school education. This should be attempted through the promotion of understanding and re-evaluation of our cultural heritage and the creation of a strong faith in future.

iii) Accelerating the process of modernization :

The most distinctive feature of modern society is in its adoption of science-based technology. Science based technology has other important implication for social and cultural life and it involves fundamental social and cultural changes which are described as modernization. Therefore, education should be concerned with the awakening

of curiosity, the development of proper interests, attitudes and values and the building up of essential skills as independent study and capacity to think and judge.

iv) Cultivating social, moral and spiritual values:--

The Commission endorsed the recommendations of the Committee on Religious and Moral Instructions and urged that such values be made an integral part of school programme, some period should be set apart in the timetable for this purpose.

Aims of Education according to the New educational Policy (1986)

The New Educational Policy accepted by the Indian parliament in May 1986 after a year-long country-wide debate has highlighted the following aim of education in India at the present structure : -

1. Best use of Economic and Technical Development

The most distinctive feature of modern society is its adoption of science based technology. Economic and technical development is gaining momentum in India to-day, but optimal use of this development is needed. Effort should be made to derive the maximum benefit from the assets already created, and it should be ensured that the fruit of this change reaches all sections.

2. Individual Development

According to New Education Policy (1986) "In the Indian way of thinking, a human being is a positive asset and a precious resource which needs to be cherished, nurtured and developed with tenderness and care coupled with dynamism."

3. Education according to the needs and problems of the Individual

Each individual's growth presents a different range of problems and needs at every stage of life from womb to tomb. Hence education is needed to be planned and executed carefully in this complex and dynamic growth process.



#### 4. Inculcation of Social and Democratic values

Indias political and social life is passing through a phase which poses the danger to long-accepted values. The goals of secularism, socialism, democracy and progessional ethics are coming increasingly under strain. Education by redesigning its pattern should prepare individuals committed to these values.

#### 5. Inculcation of human values

Life in the coming decades is likely to bring new problems and opportunities. To enable the people to benefit in the new environment will require a new design of education. The coming generation should have the ability to internalise new ideas constantly and creatively. They have to be imbued with a strong commitment to human values.

#### 6. Education as a means to control population

Our population is increasing at a very fast rate. It is a essential to bring down the growth of population significantly. Hence literacy and education among women should be spread.

#### 7. Removal of Rural-Urban Disparities

Our rural areas are having poor infrastructure and social services, therefore, they are not getting the benifit of treined and educated youth. Hence determined measures should be taken to promote diversification and dispersal of employment opportunities.

#### 8. Education for all

Our national perception is that education is essentially for all regardless of their caste creed, sex or economic status, Hence upto a given level, all students have access to education of a comparable quality.

9. Education for Acculturation

Education refines sensitivities and perceptions that contribute to national cohesion, a scientific temper and independence of mind and spirit, thereby strengthening the goal of socialism, secularism and democracy.

10. Promotion of National self-reliance

Education develops manpower for different levels of economy. It is also the substrate in which research and development flourish being the ultimate guarantee of national self-reliance.

11. Development of International Understanding

Education should motivate the younger generations for international cooperation and peaceful co-existence. The world is now so intimately interconnected that no nation can or dare live alone and the development of a sense of world citizenship has become just as important as that of national citizenship. We should move towards realizing that we are members of one world.

12. Promotion of Equality

Education should provide equal opportunities to all, not only in access but also in the conditions of success.

13. Education as a life-long process

Life long education (Universal Literacy) opportunities should be provided to youth, housewives, agriculturists and industrial workers, and professionals to continue the education of their choice at the place suited to them. Therefore a thrust on open and distance learning is necessary.

BASIC VALUES OF THE INDIAN SOCIETY AND THEIR IMPLICATIONS  
FOR EDUCATION

Dr. (Mrs.) S.P. Patel  
Professor,

1. Cherished Values of the Indian Society

The Indian society is guided by a number of positive values from our philosophical and cultural traditions such as belief in the oneness of all life, self-less action, devotion to duty and discipline, spirit of toleration, concern for the welfare of all mankind, commitment to truth and non-violence, hospitality, beauty and goodness. These are the values that should be fostered by the teacher at different stages of education in accordance with the child's developmental stage and level of understanding. Some of these values appear to be highly abstract, but many of them can be concretised if their behavioural manifestations are carefully worked out in curricular teaching and non-curricular activities. Such a task would be demanding in the beginning, but quite rewarding in the long run.

2. Modern Values

As regards the modern values of democracy, socialism and secularism which have guided the country ever since Independence, they are so important that they have found expression in the fundamental rights and the directive principles of state policy, which although not enforceable in any court of law, are fundamental for national conduct through formulation and implementation of suitable laws and policies.

3. Democracy and Socialism

Democracy refers not only to a particular form of government, but also to a way of life. The democratic way

of life denotes acceptance of the uniqueness, equality and worth of each individual and inviolable respect for him. Faith in the intrinsic worth of each individual manifests itself in different kinds of freedom granted to citizens, equality of opportunity in everything, justice to all and tolerance for differences - social, political, religious and so on. As regards socialism, it implies recognition of sociality including human brotherhood and a belief that a man's abilities, social responsibility and concern for the welfare of all, co-operation for social well-being, adoption of planning to develop national resources, social control of the production process and equitable distribution of national wealth.

#### 4. Secularism

Secularism is another important value for a pluralistic society like India. It is essential for preserving the unity and integrity of the country, as also for peace and harmony in national life. Secularism means a rational and moral outlook independent of a particular faith in divine direction. Secularism fosters scientific spirit by emphasizing objectivity, a spirit of free enquiry, and freedom from undue exaltation of the past. It recognises material needs and promotes regard for earthly life without neglecting spiritual values.

The Constitution of India scrupulously encourages a secular outlook on life. While freedom of religion in general and of worship in particular is guaranteed by it to all, the Indian state is to function independently of religion and to treat all religions on an equal footing. The state can also restrict or regulate religious freedom

if it distrubs peace, harmony, morality or health of the nation. Further, no religious instruction can be provided in any institution maintained wholly or partly out of state funds, nor can any student attending a recognised school be forced to receive religious instruction. Secularism has done a lot of good to India. It has helped improve the social climate in India by fostering religious tolerance, encouraging democratic values, promoting a healthy pluralistic outlook and breaking religious dogmas and rituals.

#### 5. Modernisation

Change is an accepted feature of modern life. Modernisation which comes about as a result of change due to rational thinking goes hand in hand with development. Modernisation includes adaptation to the spirit of modern life. It symbolises (1) the application of science and technology for the control and exploitation of natural resources; (2) the process of nation building through more efficient management, and (3) the application of new knowledge to human affairs and behaviour. Among the most important attributes of modernity are; high participation in national life, empathy, mobility, articulation of interests, aggregation of interests, achievement orientation, institutionalised political competition, rational ends-means calculation, new attitudes towards wealth, work, savings and risk-taking, faith in the desirability and possibility of change, social-economic and political discipline and capacity to defer present gratification for future reward.

The ultimate goal of modernisation is a transformation of the conditions of life for the better. It is a total transformation of a traditional society into the types

of technology and social organisation that characterise the relatively advanced, economically prosperous and politically stable nations. The most significant areas for modernisation are economic i.e. agriculture, industry, trade and commerce, transport and communications, etc., administration and management, education (including universal primary education, diversified secondary education and professional or specialised higher education, adult and continuing education); health and socio-cultural life. Further, modernisation is marked by an increased application of science and technology, an objective, analytical outlook on life, better education, higher production, better services and better standards of life.

For fostering a modern outlook among youth, it is necessary to inculcate certain interests, attitudes, values and motivations in them. The vocational teacher can do so by identifying the most important values of modernity needed by his students, by synthesising the best of traditional and modern values, and by imparting them in appropriate ways through appropriate activities.

#### 6. Basic Values and the Constitutional Provision

Several provisions of the Indian Constitution refer to these basic values which form the corner stone of our social order. While discrimination of any kind based on religion, race, caste, sex or place of birth including untouchability is prohibited, special provisions are to be made for the welfare of women, children and socio-economically backward classes including S.C.'s/S.T.'s. The constitution also provides safeguards for minorities who

should have the right to establish their own educational institutions and conserve their language and culture. The Directive Principles of State Policy include (1) democratic principles such as freedom, equality, tolerance for all points of view, willingness to accommodate and co-operate for common cause; (2) socialist principles such as commitment to equality in opportunity and status, maximising production and wealth, equitable distribution of wealth, and (3) secular principles such as respect for all religions, freedom of worship, and readiness to manage state affairs without reference to religion. The teacher must fully understand these cardinal values or principles of national life so that he can fully imbue his students with their true spirit and intent. In order that he can do full justice to them, they should permeate all his action at all times whether he is engaged in teaching or going about in life.

#### 7. Educational Implications of National Values

The educational corollary of these constitutional guarantees is the provision of equality of educational opportunity which implies provision of opportunity for every child to obtain education suited to his ability and interest irrespective of caste, colour, creed, sex or financial ability. The denial of admission to any citizen of India into an educational institution maintained wholly or partly by the state if he has the requisite merit, is further prohibited by the constitution.

#### 8. Provision of Universal Elementary Education

Realising the importance of universal primary education for the proper development of democracy, Article

45 of the constitution calls upon the state to provide within a period of 10 years from the commencement of the constitution, free and compulsory education for all children in the age group 6-14. Incidentally, this constitutional provision has not been realised even now i.e. after a lapse of 36 years for lack of adequate financial resources to cope with an ever-increasing population. Article 46 further calls upon the state to promote with special care the educational and economic interests of the weaker sections of the people including S.C.'s/S.T.'s and to protect them from social injustice and all forms of exploitation.

9. Educational opportunity at the Secondary and University stages

While education at the secondary/higher secondary stage has not been made compulsory, equality of educational-opportunity is to characterise it at this stage also. However, equality of educational opportunity at the secondary stage is taken to mean the provision of diversified curricula-academic and vocational- in accordance with the individual's needs, interests and abilities. Apart from a longer and enriched curriculum for all, equality of educational opportunity at the university/higher education stage implies the provision of educational opportunity to all those who have the required ability to profit from such education and to make social contribution in return. Thus higher education is not a right for all; it has to be earned through merit and the social returns to it should be commensurate with the social investment on it.



10. Constitutional Provision With Regard to Work & Livelihood

Work and livelihood being very vital aspects of life, equality and justice for which are equally vital, several directive principles of state policy are quite eloquent about them. Thus the state should ensure that (1) all men and women have the right to an adequate means of livelihood; (2) the means of production and wealth are not concentrated in a few people; and the control and ownership of material resources are distributed to promote common good . and (3) there is equal pay for equal work for all men and women, (4) women and children are not exploited in work; and (5) citizens are not forced to enter vocations unsuited to their age or strength (Article 39). Further, it is provided that within the limits of its economic capacity and development, the state shall endeavour to secure the right to work, to education, and to public assistance in case of unemployment, old age, sickness and disablement etc. (Article 41). The state is also obliged to make provision for securing just and human conditions of work to all and for maternity relief to women (Article 42). Article 43 requires the state to endeavour to secure to all workers a living wage, a decent standard of life and full enjoyment of leisure and social-cultural opportunities. Further, the state should promote cottage industries and take steps to organise and strengthen village panchayats for self-govt.

The teachers of vocational courses must be fully conversant with the above provisions of the Indian Constitution with regard to the citizen's right to work, to just and human conditions of work, to a living wage and a decent standard of life. All those provisions should be brought to the notice of the students, so that apart from occupational knowledge and competence, they also know the conditions which can be created for their exercise.

AIMS AND OBJECTIVES OF DIFFERENT STAGES OF SCHOOL EDUCATION

Dr. (Mrs) S.P. Patel  
Professor,

1. Need and Significance of Educational Objectives

Aims and objectives of education have a unique importance. They provide the starting point of any educational endeavour. They also determine the directions in which the educational enterprise should move. Finally, they provide the framework or the criteria for judging the success or failure of the whole educational enterprise.

2. Different Kinds of Objectives

Aims and objectives of education are defined at various levels of generality. First of all, there are overall objectives of education which are derived mainly from the lofty ideals accepted in our national life and basic values enshrined in our constitution viz. highest individual development and fulfilment, truth, dharma or righteous action, social responsibility, peace, non-violence, love for humanity, beauty, unity in diversity, democracy, socialism, secularism and modernisation. These objectives furnish guiding principles to all kinds and levels of education in the country and also reference points to judge the appropriateness or effectiveness of the educational processes and their results. Then there are stage wise objectives for the university/higher education, higher secondary, secondary, elementary and preschool education. As regards different kinds of education, objectives of education for professional, vocational and general education are separately worked out as also those for different professions or vocations. Lastly, there are classwise objectives and subjectwise objectives which can further be broken up

into topic wise, unitwise and lessonwise objectives. In order to understand the objectives of education at the secondary stage, it is necessary to have an idea of the objectives of education at the preceding stages.

### 3. Educational Objectives of Preprimary Education

At the preprimary level, education of the child involves the development of good health habits, personal adjustment patterns, desirable manners and social attitudes, emotional maturity, good physique and basic motor skills, clear speech to express thoughts and feelings and encouragement of independence, intellectual curiosity and aesthetic appreciation. The child's mode of learning at this stage is mainly play and his thinking is prelogical and later intuitive, based on concrete experiences.

### 4. Educational Objectives for the Elementary Stage

Education at the elementary stage (6-14 years) is free and compulsory in our country as per our constitution. While a number of objectives from the previous stage continue with increased or decreased emphasis at the primary stage, some new objectives which emerge in accordance with the imperatives of education at this stage are: acquisition of the three R's (which are the most important tools of formal learning), knowledge of the social and natural science, development of language, skills of observation and habits of co-operation, development of physical fitness through games and sports, inculcation of a sense of social responsibility, development of aesthetic appreciation, motivation and capacity for productive and creative work.

use of leisure, made possible by the increasing use of machines has become essential to round off the process of individual development and fulfilment through education. However, all this is to be done within the larger framework of the accepted national ideals and values listed in the opening paragraph which are to guide our national endeavours in any sphere of life including education. Also, their pursuit should lead to the further development of a set of important moral and ethical values and character which would be a highly significant outcome of the educational process. Indeed, the country cannot make any progress unless its coming generation is imbued with a moral and ethical character which would be the pride of any nation.

#### 7. Cardinal objectives of Education at the Secondary Stage according to NEW EDUCATION POLICY

Secondary education begins to expose students to the differentiated roles of science, humanities and social science. This is also an appropriate stage to present children with a sense of history and national perspective and give them opportunities to understand their constitutional duties and rights as citizens. Conscious internalisation of a healthy work ethos and values of human and composite culture should be brought about through appropriately formulated curricula. Vocationalisation, through specialised institutions or through the refashioning of secondary education at the + 2 stage can provide valuable man power for economic growth.

## AGENCIES OF EDUCATION AND THEIR ROLE IN VOCATIONAL EDUCATION

-Dr.D.D. YADAV

By agencies of education, we mean those institutions, organisations or sources which play a significant role in the process of the development of an individual. Agencies of education have been differently classified by different educationists. Some of the major classifications are as follows:-

### First Classification

1. Formal Agencies: Formal agencies of education are those which have a pre-determined location, time, aim, plan, curriculum as well as trained educators. Education is imparted consciously and intentionally. Some of the formal agencies of education are schools, religious institutions, libraries, art galleries, etc.
2. Informal Agencies: Informal agencies of education are those in which education is imparted informally. There is lack of all formalities in these agencies. Education takes place spontaneously in these agencies. Some of the informal agencies of education are family, play groups, gangs etc.

### Second Classification

1. Active Agencies: Active agencies are those which impart education through personal interaction of the individuals. Education is a two-way process in which individuals influence the behaviour of each other. Some active agencies of education are family, school, religious institutions, society, state etc.
2. Passive Agencies: In passive agencies, interaction is only a one-way process. They influence the individuals but vice-versa is not true. In these agencies, social process is nominally controlled. Some of the passive agencies are radio, TV, cinema, newspapers, etc.

## NEED FOR COORDINATION BETWEEN SCHOOL, HOME AND COMMUNITY:

Our educational system is in a state of rapid and profound change. In every aspect, the old is giving way to the new. Twenty years ago, it was simple to administer the school. Only the academic classes were there with few social activities, athletic meets or school clubs. Vocational skills were also acquired outside the institution.

Education today is a big enterprise in a complex society. It has to cater to many needs of the individual and the society. Education must now include a comprehensive programme for the physical, mental, moral, emotional and vocational growth of children. If education has to be according to ability and aptitude, educational and vocational guidance has to be an integral part of it.

The culture in which the process of education operates and which it should reflect in a dynamic society poses many problems for the teacher. Any one who aspires to be an effective and successful teacher must understand the nature of the community which his institution is required to serve. Because of this, there is a need for developing more intimate home-education-community co-ordination.

### The Home and the School

In Indian culture, the mother is regarded as the first teacher of man. Family plays an important role in the education or development of the child. The following are some of the functions of home.

1. Physical development: One of the important functions of family is to provide opportunities for sound physical development. Home has the responsibility for food, clothing, rest, sleep, physical exercises, etc.
2. Intellectual Development: Family provides opportunities for mental development of the child i.e., his language and intellectual development. If there is rich intellectual environment in the family mental development of the child is speeded.

### 3. Socio-emotional, cultural and moral development:

Family lays the foundation of character. Family is said to be the basis of socio-emotional, cultural and religious development.

4. Vocational development: In the past, vocational competence of the individual was developed in the home alone. The father passed occupational skills to the son. But now due to change in vocational patterns and advancement of science and technology, complete development of vocational competency at home is not possible. But nevertheless there are chances that in the family, he acquires some attitudes and interests in respect of his future vocational areas. Sometimes he even gets opportunity to do some work.

### Functions of the School

The school is an active and formal agency of education. It is a specialised agency which has become quite important in the growing complexity of cultures and civilizations. The school has to perform many functions such as around development of the child, transmission of culture, promotion of the social efficiency, cultivation of higher values, imparting vocational skill, promoting national integration, etc.

If a school is to be successful in discharging its functions in the present age, it must have intimate relationship with the family. In an ideal scheme of things, the home should become school and the school should become home. Ways of securing cooperation between the home and the school:

The following are the ways and means of securing co-operation between                      and school:

Celebrating

1. Parents' Day
2. Organising Parent-Teachers Association.
3. Having representatives of parents on the management and vocational education committees.
4. Teachers' visits to pupil's home.
5. Inviting parents to school functions such as exhibitions

of the products made by vocational students.

6. Sending progress reports to parents.
7. Seeking reports from parents about home-work.
8. Organizing educational talks and discussions.

#### The School and the Community:

Society has got its own place as an agency of education. Broadly speaking, family should be regarded as a unit of society. Man is a social being. He is born in the society and he has to pass his life in the society. School is also an important part of society.

Society influences the development of the child. In real sense, it performs functions in respect of education. Such functions are:-

1. Establishment of good schools
2. Establishment of libraries
3. Provision for adult education
4. Providing literacy and cultural education
5. Providing vocational education
6. Inculcating moral, social and spiritual values.

School is nothing but a society in miniature. It is an integral part of the society. A good society depends upon good schools and a good school depends upon a good society.

#### Role of the community in vocational Education:

Both school and society are complementary to each other. The school should function according to the cultural background and changing needs of the society and the society should give full co-operation to the school.

The school should utilise experiences which the child acquires at home. These experiences include those related to work and occupations. The child sees the members of his family engaged in various occupations/professions. He gets acquainted with these occupations and also learns many work skills through a variety of work situations. This he does by imitating his father, mother, brothers, sisters, relatives and even neighbours. The school should identify these



experiences and further refine them.

The community has a vast range of economic resources. So many factories, industrial enterprises, business centres, agricultural farms, etc. are available in the community. The child should be exposed to different types of work situations by utilising the above community resources. The school can exploit these community resources for developing work skills among vocational students through on-the-job training in cooperation with the community. It can utilise the services of experts available in the community for teaching vocational courses. Only with such help can vocational education be imparted effectively in the present state of scarce infra-structural facilities in the school and shortage of vocational teachers. Even in selecting and planning of vocational courses help of enlightened community members should be taken. Such help will immensely enhance the social acceptability of vocational courses.

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## Role and Responsibilities of Vocational Teachers

Dr. D.D. Yadav,  
Lecturer

The teacher has always been the central excel of all educational systems. Therefore, the success or failure of the vocational scheme largely depends on the vocational teacher. In the words of Dr. Radhakrishnan "Teacher has an important place in society. He is the central point in the transmission of intellectual traditions and technological skills from one generation to another, and is helpful in illuminating the lamp of culture. He not only guides the individuals, but also shows direction to the nation. Therefore, teacher should understand his responsibilities towards society." Since the outcome of the educational process reflects the ideals, purposes, preparation and conduct of the members of the teaching profession, anyone who chooses teaching as a career binds himself to the line and acts in accordance with the ideals and standards of the profession.

Vocational education is new in our system of education. This is skill-based education. Here more placed emphasis is/ on practical work, on-the-job training than on theoretical knowledge. Thus the vocational teacher will have to perform many duties related to training in vocational skills, practical work and on-the-job training. He will have to discharge double duties i.e. those which belong exclusively to vocational teachers and those which form part of academic teacher<sup>is</sup> work. Moreover, vocational edu being a new and exploratory area, teachers are confronted with many problems. Most of vocational teachers have

received only liberal education as an accomplishment of their ('graduate' and 'post-graduate' degrees. Pre service training on vocationalisation has not yet been introduced, text books on vocational courses are often not available, the content and process of evaluation is not satisfactory and other infra-structural facilities are also meager.

To compensate for the above shortcomings, the vocational teachers need much more enthusiasm, zeal and competence for the success of vocationalisation of education. They should be in close touch with modern developments in the field of vocationalisation of education. In the words of Tagore, "A teacher can never truly teach unless he is still learning himself. A lamp cannot light another lamp unless it continues to burn its own flame."

Due to the fast development of science and technology, the Indian society is changing from a traditional society to a modern developing society. Occupations pursued by people in such a society are generally specialized in nature. The division of labour is complex and sophisticated. People prefer changed or new patterns of thinking, believing and behaving which are necessary in a modern society. Along with various other duties such as socialising the children, the teacher has also to orient them towards the world of work as well as prepare them for adjustment in modern society. In future, only tactful, resourceful, highly educated and disciplined persons who can cope with changing situations will be able to function effectively. Hence, the teacher's role should be in the direction of developing skills of grasping the situation, quick decision-making, initiative-taking and carrying out innovations, evaluations etc.

### The Role of the Teacher in the School

A teacher has to perform four kinds of roles:

- 1) As an agent for socialisation
- 2) Teaching role
- 3) Professional role
- 4) Informal roles.

### Role of the Teacher as an Agent for Socialisation

India is a democratic, socialistic and secular state. The teacher has to lead the students, showing the way and influencing and guiding them in their thinking, activities and conduct. He should exercise adequate control and appropriate authority. He should treat all children with objectivity and fairness. The teacher represents the adult society and his task is to propagate and promote the social norms and ideals. He is an agent of morality and moral development. His role is to deal with the students and socialise them in a humane and rational way. His own behaviour should be exemplary.

### Specialist Role of the Teacher

In the schools, there are specialist roles like that of headmaster, subject teachers and teachers of special subjects. In secondary and higher secondary schools, specialists are supposed to play the role of subject teachers. They are expected to acquire adequate mastery in the theoretical knowledge and skill of the vocational course, as also in the proper methodology and skills of teaching the course.

### Professional Role of the Teacher

There are professional organisations of teachers which are generally concerned with their rights. While accepting

to follow the legitimate directions and norms of their professional bodies, teachers are also supposed to follow the rules and regulations of their schools, schedule of courses and examinations, official decorum, and orders and suggestions of their superior officials. A profession implies a significant social service which the members must perform with a philosophy, a sense of commitment and dedication, and an etiquette. Education is a dynamic science which they must master and utilise in the proper discharge of their functions.

#### Informal Roles of the Teacher

Teacher has to perform several informal roles in the school. He may act as staff secretary, picnic organiser, party organiser, Public Relations Officer, special advisor to headmaster or students council, and be made responsible for discipline, examination, school supervision, co-curricular activities etc. It has been observed that informal roles are very significant as they allow self expression to teachers, facilitate the smooth working of the institution and strengthen the organisation of the school.

The general role of the teacher is to teach the class. He performs this role by following a variety of teaching skills, methods and techniques of organisation and control. According to Wattenberg, the most significant roles performed by a teacher may be as:

1. Representative of society.
2. Judge
3. Resource Person.
4. Helper
5. Referee
6. Detective

7. an object of identification.
8. Reducer of anxiety
9. Ego-supporter
10. Group-leader
11. Parent surrogate (Substitute)
12. Friend and Confidant

### Conclusion

The Indian society is fast changing. It is education. Educational technology is also developing at a very fast rate. The teacher of the future will be expected to perform the role of a planned organiser of curricula, innovator of educational ideas, practices and systems, and a resource person. At the same time, he will have to be a good communicator, efficient organiser of learning situations and a democratic group leader. The role of the teacher will have to be shaped in the light of the changing demands on the school. The teacher's role as an agent of social change will be intensified. He should act as radical reformer of society and education.

## DETERMINANTS OF EFFICIENT LEARNING

Dr. N.K. Dutt,  
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This paper on Learning presents 'Recipes' of efficient learning-the term learning including teaching, learning, retention and reproduction. Often we come across adolescents and even adults with such problems:-

"I cannot concentrate my mind on studies. How to achieve this concentration?"

"I can easily understand and remember whatever I read, but I forget soon after? How to retain it?"

"I remember everything in the evening but I find that my mind first gets befogged and then black just before the examination begins. How to overcome this trouble?"

"That friend of mine can memorize things in a much shorter period than I. How can I improve upon this deficiency?"

We shall try to answer such questions by offering some practical hints on Efficient Learning, which have been extracted from various experiments, researches, etc. as given earlier.

### What is efficient Learning?

Efficiency in learning can be measured by three factors:

1. Accuracy-How accurate do you remember?
2. Speed-How soon do you remember?
3. Retention-How long do you remember?

Depending upon the problem and purpose, we can devise weightage for these three factors to determine overall efficiency. But in no case any one is to be left out.

### Determinants of Efficient Learning

There are three variables which determine efficient learning:-

1. The learner
2. The material to be learnt.
3. The method of learning.

We shall discuss each in detail.

**The Learner-**The learner is the king-pin in the process of learning. He should be fully motivated for learning. One man can take the horse to water, twenty cannot make him drink. In fact one of the primary purposes of teaching is not to stuff the mind of the child with dead word or inert matter but to motivate him to learn. He will make use of classroom instruction, library or text-books himself if he has an intense desire to learn. Motivation here is comparable to hunger. The more the hunger; the better the digestion. There are numerous reasons which determine motivation of a particular student. Given sound physical health, proper development and emotional poise, one should naturally be motivated to learn. It is erroneous on the part of a teacher to believe that 'until he motivates, the students will not be ready to learn'. Some other prominent reasons are :

1. **Interesting Teaching-**The teacher himself should be motivated. Only a burning candle can light another candle.



The following advice from an experienced teacher is of great significance :

"O teacher, if you run, the students will walk. If you walk, the students will sit. If you sit, the students will lie down. If you lie down, the students will sleep. If you sleep, the students will die."

2. The student should be able to relate 'learning' with his life, environment and needs-both immediate and ultimate. It is ultimately in the context of 'usefulness' that proper motivation is aroused. It is neither always possible nor desirable to raise motivation for material benefits. The usual coaxing from parents or teachers that if you do not study, you won't be able to earn anything is neither psychologically nor ethically sound. Learning is for becoming a better person, for a positive end.

3. There should be a proper 'set for study'. It has been observed that 'good study habits' do mean developing a 'set'-i.e., a proper place, time and furniture for study.

'Old parrots cannot learn' may be true, but it is not the age which inhibits one from learning new things, but lack of motivation, lack of energy and interference of a lot of previous learning. A child is hopeful of the future, whereas an old man is usually remorseful of the past.

The Material to be Learnt-Efficient Learning depends upon the kind of material too. Moreover, there is always a physiological limit to learn something. Noboday can ever remember the entire Railway Time-Table whatever the motivation or method of learning.

On the basis of certain experiments, it can be safely generalized that :

1. Sensible material is better learnt than the non-sense material.

2. The more the rhythm in the material, the more efficient the learning. Poetry is easier to learn than prose. Prose is easier to learn than sensible words but disconnected and unrelated with one another. Sensible words are easier to remember than non-sense syllables. This is precisely the reason that in ancient times when there was no press and knowledge had to be passed on from generation to generation through memorization, the material was recorded in the form of poetry. Prose appeared almost with the invention of printing press.

3. For efficient learning, the material should be arranged in a systematic, logical sequence. If possible step A should lead to B and B to C and so on.

4. For efficient learning, the material should be arranged in an ascending order of difficulty. This maintains the tempo of motivation too.

The Methods of learning—Given the same learner and the same material, the method of learning will go to a large extent to determine efficiency in learning. Here are a few tips for efficient learning:

1. Stress the correct performance from the start.
2. Concentrate upon the actual task to be learnt.
3. Try to understand and critically appreciate the material. The unintelligent rote memory is a very inefficient method of learning.

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4. Learn in natural units, not in piecemeals. The unit should be sufficiently large, independent and well-knit in itself. It should not be unnecessarily broken. The size of this 'unit' depends upon the age of the learner, his motivation, memory and purpose of learning.

5. Adapt whole-parts-whole method to learn. This means that a student should first understand the material in totality, then study its parts in detail and again try to master the topic as a whole. This gives a better mastery over the subject.

6. Distributed practice is more efficient than massed practice. If there are ten hours with me for study, in massed practice I shall study continuously for eight hours and then take rest for the two hours continuously. In distributed or spaced practice, I shall take rest for 15 minutes after every one hour of study. In longer hours of study before final examination, it is always very economical to adopt distributed practice, especially when the span of study goes on decreasing gradually and the span of interest goes on increasing gradually during the entire day of work.

7. Since mastery proceeds from ends, the most important points in the material should appear either in the beginning or towards the end since most of the points towards the middle of the material are likely to be remembered last and forgotten first. If a list of twenty non-sense syllables is repeatedly given to a subject to remember, in the first trial, the first two or three and the last two or three syllables are likely to be remembered. Then gradually mastery will travel towards the middle ones. That is why, good teachers always give the most important points in the beginning of the

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In the first place, the teacher should not dwell upon the structure and also towards the end. In between they dwell upon every illustration and explanation.

8. Beware of plateaus. That has to occur. It can be overcome only by providing rest periods in between and having faith in the fact that "this plateau shall be overcome by persistence and motivation." This should also be remembered

that to a great extent, 'change of work is rest'. If you are tired while solving the sums in Statistics, take up the book on Philosophy of Education. You can fit-bly read it and understand it till you actually nod off to sleep.

9. Active participation in learning is a very efficient method. Group discussions, seminars, project method, questioning and the like make student an active participant in the process of learning. Mere lecturing makes the learner passive.

10. Verbalization and recitation make learning more permanent. Whereas verbalization is more useful in learning skills, recitation is equally useful in learning academic material. Suppose I have to learn by heart the way to my friend's house, I can verbalize like this, "Go straight.

After 100 yards turn to the right and....." Recitation is trying to speak by heart the material previously learnt.

11. Always overlearn the material. If you think that you have mastered the material in nine readings, give at least two readings more. This will ensure better retention.

12. Remember whatever you have to/at night.

Sleep peacefully and do not bother in the morning. If you have to give a speech at 9.00 a.m. or to appear in a test at that time, most of what you remembered at night will automatically be recalled. Only you have to learn to relax physically and mentally in the period in between mastery and

and recall. Some detailed instructions regarding this relaxation therapy are given in the chapter 'Psychology of anxiety'. If you order or coerce your mind to get up early in the morning at 4 a.m. or to remember something at a particular time, you will find that you do get up at 4 a.m., but some irresistible desire will put you to bed again at 4.30 a.m. You will be reminded of the material at a particular time, but confusion will follow soon. This so called 'will power' or coercion does not work because there is a constant tension as an accompaniment. In Psycho-analytic terms, you order the conscious but the unconscious would always revolt which is much stronger than the conscious and at the same time ruthless illogical and unfathomable. If you just relax from head to toe and suggest to yourself in imagination that whatever you have remembered is being gradually recalled in the examination hall, or, that you are getting up at 4 a.m. and studying with full concentration, or, that when you pass by that crossing, you will drop this letter in the letter box, you will find that this imagination would seldom disappoint you. In an experiment, a group of motor cyclists was 'very strongly advised' to avoid definitely a particular stone on the road. Amazingly, majority of them struck against the stone. They reported that at first, they saw 40' wide road, but gradually and gradually as they approached the stone, they could see only the stone, not the road, and they collided with that. They were not trained in relaxation to avoid the stone but 'coerced' to keep away and the order - "keep away from the stone"-was gradually dinned into their ears. This all produced tension and hence the undesirable result. We can surely overcome most of our defects by mildly suggesting and imagining the improvement, especially just before sleep,

when the body is just relaxed and Ego is neither in the conscious nor has regressed into the unconscious, but is just in the transitory borderland of semiconscious. Relaxation is better than tension as a determinant of efficient learning and imagination is mostly more helpful than 'will power' in similar situations.

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## LEARNING OF PSYCHOMOTOR (VOCATIONAL) SKILLS

-by A.V.GOVINDA Rao

Skill can be considered as ability to do a work easily, speedily, and accurately. When you observe a highly skilled person at work, you will notice that

- (a) he appears to pay less attention to the specific movements which constitute the whole act and his actions appear to be automatic or involuntary.
- (b) he can perceive and respond to more but less obvious cues and carry out a sequence of movements in the presence of fewer cues;
- (c) he obtains feedback more rapidly and if necessary, corrects his movements more quickly;
- (d) he has greater speed and co-ordination; and
- (e) he has greater stability under a variety of environmental conditions.

Skill learning begins with a cognitive phase, of relatively short duration; proceeds with an organizing or fixation phase and ends with an autonomous or perfecting phase. Though, everyone passes through these phases while learning a complex skill, it should be remembered that they are not distinct units but overlap each other.

Successful learning of a skill by a student depends not only on how he learns it, but also on his entry behaviour and his readiness to learn. In other words, he should possess the requisite psychomotor abilities in requisite degree. This is an absolute necessity, since each skill depends upon certain basic psychomotor abilities such as manual dexterity, motor co-ordination, reaction time, finger dexterity, speed of arm movement, etc. At the same time, a student who possesses the required psychomotor abilities must also possess an intense intrinsic motivation if he is to master the skill. Sometimes, it is possible to generate motivation through manipulation of such factors as rewards and punishments, successes and failures etc. Motivation generated by such methods is called extrinsic motivation:

It should be noted that indiscriminate use of external motivators is likely to act as hindrance in learning of skills, rather than as facilitators. The learning situation must be so designed as to kindle the intrinsic motivation facilitating gradual withdrawal of external motivators. It is evident that motivational readiness is essential for successful learning of any skill. For example, a child of 3 years age is not motivationally ready to learn the skill of soldering, whereas a child of 15 years age is ready to learn such a skill.

For successful learning of skills, the necessity of possessing the right type of entry behaviour in the form of psychomotor abilities has already been mentioned. Possession of needed entry behaviour in the student can be ensured only by appropriate procedures for selecting students. Usage of suitable aptitude and intelligence tests is a must in any such procedure. The role of vocational guidance, which helps an individual

- (a) to know about essential competencies which one should possess for entry into various occupations;
- (b) to know about various occupations;
- (c) to choose a vocation/which he possesses needed degree/for of aptitude.
- (d) to undergo suitable training; and
- (e) to enter the chosen vocation, cannot be over-emphasized in this respect.

Assuming that the student has attained the minimum level of motivational and motivational readiness and that he has already acquired minimum entry behaviour, let us now consider the methodology of teaching skills.

We already know that skill learning begins with a cognitive phase, during which the student does not engage in much practice, but does cognize the nature of the skill. In this phase, students attempt to intellectualise the skill. In order to ensure that the student passes through this stage successfully, the teacher must plan the training procedure carefully. Following guidelines may be kept in



view while helping the student to pass through cognitive phase.

1. Analyse the skill into its components. Let each component contain only one stimulus-response bond. This process of breaking down the skill into its components is called task analysis.
2. Decide the order in which these component sub-skills are to be learnt. Make sure that each sub-skill naturally leads onto the next sub-skill. While deciding the order in which the sub-skills are to be learnt, keep in view the learners' abilities and developmental level as well as principles of contiguity. (i.e. timing, co-ordination).
3. Demonstrate each sub-skill. Your demonstration
  - (a) must provide an overview of the skill to be acquired.
  - (b) must provide an imitable model.

Help the student to verbalise the sub-skill, describe what to do, give information about errors which are likely to occur and how to avoid them. To give an effective demonstration, the teacher should not only be a master of the art of demonstration, but also a skilled communicator. For giving an effective demonstration,

- (a) prepare the students to observe the demonstration by providing an overall view of what is going to be demonstrated;
- (b) make sure that everyone can see and hear what you are doing and saying;
- (c) describe verbally each step;
- (d) draw attention to salient features of every step;
- (e) pace the demonstration so that everyone can comprehend each step;
- (f) use questioning as a tool for ensuring that everyone is comprehending each step;
- (g) increase pupil participation by asking the students to make important observations and by encouraging them to discuss what they have seen;
- (h) summarise the entire demonstration through question-answer session.

For ensuring effective communication,

- (a) Explain briefly, clearly and precisely. (Using beginning and concluding statements, using explaining links such as 'hence', 'therefore', 'as a result of' etc., testing students' understanding frequently, assessing the effectiveness of explanations)
- (b) Illustrate with examples wherever necessary making sure that they are interesting and relevant.
- (c) Use appropriate media (verbal and nonverbal).
- (d) Use appropriate stimulus variation techniques such as movements, gestures, change in speed of pattern, focussing, change of interaction styles, posing, oral-visual switching, etc.
- (e) Use probing questions at appropriate places.
- (f) Maintain fluency in questioning.

After making sure that the student has gone through cognitive phase, allow him into organising or fixation or practice phase. Arrange for appropriate practice. In this phase,

- (a) initial responses must be guided verbally and physically;
- (b) importance of meticulously following the standard procedure must be insisted upon;
- (c) student must be encouraged to work as speedily and accurately as possible;
- (d) appropriate feedback (intrinsic or extrinsic) must be provided. Criticism which is likely to discourage the learner's enthusiasm should be avoided; and
- (e) learner should be encouraged to evaluate his own performance.

While arranging for practice of the skill, ensure that it is carried out under desirable conditions both physically and contextually. The more closely the conditions of practice approach the conditions under which the skill will actually be used, the more effective the practice is. Depending upon the nature of the skill and motivation, decide the duration and

of each practice session and interval between practice sessions. Whether to teach a skill in 'whole' or by 'parts' must also be decided upon keeping in view the abovementioned factors. This phase should be continued until the chance of committing errors is reduced to zero and correct behaviour pattern becomes fixed.

Finally, the student passes into autonomous or perfecting phase. This phase is characterised by increasing speed of performance in the skills and improvement in accuracy to the point at which errors are unlikely to occur. This is achieved over a long period of time by continued practice. This is the stage achieved by an expert where complex skills are performed at an automatic level mechanically. In fact, the performance of the skill becomes involuntary, inflexible and even locked in. Only practice, precise combination of motor, cognitive and affective characteristics result in such a perfection. In this phase, student also increases his resistance to stress and to the interference of the distracting factors existing in his surroundings as well as of his other activities in the world.

In short, the following are the minimum teaching behaviours that are applicable to all skill teaching.

- (a) analyse the skill into its minutest components and sequence them keeping in view learner's abilities.
- (b) demonstrate the correct response in order to provide for imitable model.
- (c) arrange for appropriate practice.
- (d) guide the initial responses verbally and physically.
- (e) provide appropriate feedback and correct inadequate responses, and
- ff) encourage independent self-evaluation.

## CHARACTERISTICS AND PROBLEMS OF ADOLESCENCE AND WAYS OF MEETING THEM BY VOCATIONAL TEACHERS

-A.V. COVINDA RAO.

The term 'adolescence' is derived from the Latin word 'adolescere' meaning 'to grow to maturity'. This critical period or stage of an individual's life begins when he or she attains puberty (a period when one's reproductive organs become functional) and ends when he or she attains adulthood legally, i.e. 18-21 years. Many psychologists further subdivide this stage into two sub-stages called early and late adolescence.

A teacher in vocational courses will most probably be teaching students who are in the beginning of late adolescence stage. Hence, it is essential for him to know the important characteristics of adolescence in general.

### Characteristics of Adolescents:

As you might have noticed, adolescence is a period of rapid change. Most noticeable of these changes are physical changes. A sudden and surprisingly fast growth rate called 'growth spurt' can be noticed during adolescence.

(Girls: 8.5-11.5 years beginning, 12.5 years climax,

17-18 years end;

Boys : 10.5-14.5/<sup>years</sup>beginning, 14.5-15.5 years climax,

20-21 years end)

During this period the body size, body proportion, primary sex characteristics (viz. growth of gonads), secondary sex characteristics (viz. Boys: hair, voice, skin, etc. Girls: hips, hair, breasts, skin, etc.), Change rapidly.

Apart from the most visible changes occurring in these areas, the digestive, circulatory, respiratory and endocrine systems also attain maximum growth. Due to the fast rate at which the body changes, the general health is likely to deteriorate. Fatigue, restlessness, upsetting of digestion are common. Girls may suffer from anaemia, headache, backache and abdominal pain. If, at this period, scientific knowledge about (a) what and why of body growth, (b) reproduction, (c) techniques of maintaining good health in general, and need for good nutrition, exercise, etc. in particular are not given, the adolescent is likely to be a victim of emotional disturbances. Through sympathetic guidance or counselling, the adolescent must be made to accept his physique and to use it effectively. In fact this is one of the developmental task of : adolescence.

Along with physical changes, emotional, mental, and social behaviour of the adolescent also changes rapidly. Heightened emotionality, anxiety, sensitiveness, depression, etc. are common characteristics of emotional life of an adolescent. This is the stage at which he should learn to control his emotions and express them in socially acceptable manner. In fact, he should also be free from emotional over-attachment to his parents. This is another developmental task of adolescence. A life without emotions is impossible. Even negative emotions such as fear, jealousy have their own value. Hence, the adolescent should be taught through 'modelling', the art of controlled expression of emotions. Counselling is a must for adolescents who exhibit abnormal emotional behaviour.

An adolescent is in 'Formal operations' stage in the field of mental development. He develops the ability of dealing with abstractions, solving problems on his own initiative, using more words effectively, finding cause-effect relationships etc. This is the stage when he must choose a vocation and prepare for entering it. He should also acquire knowledge and skills needed to become a constructive member of his community. Educational and vocational guidance at this stage helps the adolescent to perform this developmental task effectively.

This is the stage at which the adolescent is expected to learn (a) socially responsible behaviours, (b) to establish satisfactory relationships with peers of both the sexes and to prepare for starting a family. If suitable experiences are provided by the teacher, he will not only learn these, but also learn to distinguish 'friends' from 'acquaintances'. It is essential that he should be provided with opportunities to develop skills needed for healthy social life, the lack of which may make him a 'social misfit'.

#### Problems of Adolescents:

Because of the abovementioned changes taking place during adolescence, it can be considered as a period of problems. The adolescent will be encountering innumerable problems which he must solve in order to lead a happy life. As in other areas, we cannot only see individual differences but also sex differences in the problems of adolescents. For example, the problems of girls will be centering around progress in school, physical beauty, character, social and home adjustment whereas the problems of boys will be centering around obtaining more money to meet the personal expenses,

future life, plans , acquiring physical strength. In early adolescence, problems relating to successful participation in school activities, attracting members of opposite sex, personal adjustment are dominant whereas in later adolescence, problems relating to progress in studies, choice of and preparation for a vocation, personal adjustments are dominant. Due to the existence of these problems and contradictory demands of the society (viz. in certain situations we treat the adolescents as children and in certain other situations, we expect adult behaviour from adolescents), his behaviour will be unpredictable as well as unstable. In fact, adolescence can also be called a period of instability. This creates a lot of problems pertaining to guidance for teachers and parents. Added to these difficulties, the difficulty of making the adolescent realize the difference between idealism and reality. Net result is that we have on our hands a volatile, unhappy student who has to be handled cautiously. Good education and vocational guidance coupled with personal counselling by a sympathetic teacher is a must at this stage.

#### Need for Guidance and Counselling by the Teacher:

In short, adolescence is a period of transition, transition from childhood to adulthood and dependency to independency, which creates innumerable adjustment problems. Hence, as has been mentioned earlier, personal counselling must be resorted to help the adolescent solve his adjustment problems. As we find a lot of individual differences arising from interaction between heredity and environment, no universally applicable solution can be suggested. Each adolescent has to be considered as a unique individual and treated as such. This is possible only through counselling

which is a specialised form of personal guidance to help the individual to solve his adjustment problems. It can either be directive counselling in which the counsellor plays the dominant role or non-directive where the counsellor himself is encouraged to analyse his problem and to find out the solution. The latter appears to be better for achieving stable behavioural changes.

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SKILL - BASED TEACHING IN VOCATIONAL COURSE

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INTRODUCTION

The changing educational pattern (10+2+3) has emphasised Vocationalisation of education at higher secondary stage and the improvement of educational standards at all the stages of education. With the introduction of Vocationalised courses at the higher secondary stage, there is need for teacher preparation for the same. The quality of these teachers depends upon soundness of the training imparted. For ensuring high quality teaching in vocational courses, professional experts should be involved in imparting training for teaching skills, which will bring about the much-needed improvement in the learning behaviour of children in terms of knowledge, skills, attitudes, values and appreciations. The emphasis has to be on qualitative improvement which obviously has not received adequate attention of educators in this field.

Teaching is a complex process and is defined differently by different authors .. Clarke (1970) stated that "Teaching brings about change in pupils' behaviour" Brown (1975) considered teaching as a many sided activity comprising - questioning, giving information, explaining, listening and such other activities, intention behind which was to bring about 'learning'.

In simple words, teaching constitutes a number of verbal and non-verbal teaching acts like questioning, accepting pupil responses, rewarding, smiling, nodding approval, and making other movements and gestures. These acts in particular combinations facilitate the achievement

of objectives in terms of pupil growth. A set of related teaching acts or behaviours performed with an intention to facilitate pupil's learning can be called a teaching skill.

Teaching Skills- Gage (1968) defined teaching skills as specific instructional techniques and procedures that a teacher may use in the classroom. Teaching skills represent an analysis of the teaching process into relatively discrete component that can be used in different combination in the continuous flow of a teacher's performance."

All definition of teaching skills specify that a teaching skill is a group of teaching acts or behaviours intended to facilitate pupil learning directly or indirectly. The simple definition of a teaching skill is 'a set of teacher behaviours which are specially effective in bringing about desired changes in pupils'.

#### Identification of skills:

There are many approaches for identifying teaching skills. Firstly, it can be done by observing a number of teachers in a variety of classroom situations. Secondly, it can be done by analysing the teaching task through interviews and discussions with the teachers. Thirdly, it can be done by analysing the school curriculum and objectives and thinking what teaching acts would help in achieving them. This judgement is made on the basis of experience, research findings, and psychological theories. Fourthly, identical can be made through conceptualizing a model of good teaching based on the opinions of teachers, pupils, and headmasters. However, attempts of this nature have not given fruitful results on account of subjectivity and lack of consensus regarding role expectations.

Efforts have been made to list teaching skills following one approach or the other and to develop them among teacher trainees. Thus fourteen skills have been listed at the Stanford University (Allen & Ryan, 1969) and eighteen teaching skills were listed at the Far West Laboratory, California (Borg et al., 1970) and so on. Similar attempts have been made at the Centre of Advanced Study in Education (CASE), Baroda, where twenty one teaching skills have been listed.

Teaching competence for vocational courses likewise comprises a peculiar combination of various teaching skills. Skills for demonstration, illustration and experimentation are especially important for vocational education and training besides other teaching skills. The following skills are particularly useful for vocational teachers -

- 1) Skill of Stimulus variation, (2) Skill of Questioning (fluency in Questioning and probing questioning), (3) skill of Reinforcement, (4) Skill of Illustrating, (5) Skill of Explaining, (6) Skill of demonstration and experimentation

A brief description of each skill is given below:-

- 1) Skill of Stimulus Variation: This skill is related to classroom attention. It is based on the principle that change in perception of one's stimuli captures one's attention and uniformity in the perceived environment distracts one's attention. This skill involves deliberate changing of various attention producing behaviours by the teachers in order to keep pupil's attention at a high level. Such behaviours include teacher movements, gestures, changes in speech patterns, focussing, changing interaction style, shifting sensory channels, pausing and so on.

## 2) Skill of Fluency in Questioning:

This refers to the skill in asking questions. By fluency is meant the use of as many questions as possible in a given period of time. However, no question is considered to be relevant unless it is followed by effective student responses. The purpose behind this skill is to increase the number of relevant and meaningful questions asked by the teacher in a given period of time keeping in view their effectiveness.

## 3) Skill of probing Questions:

Probing requires that teachers ask questions that require pupils to go beyond superficial 'first answers'. This can be done in five ways: (i) asking the pupil for more information and/or more meaning; (ii) requiring the pupil to rationally justify his response; (iii) refocusing the attention of the pupils or class on a related issue; (iv) prompting the pupil or giving him hints; redirecting the question to other pupils.

## 4) Skill of Reinforcement:

Reinforcing desired pupil behaviour through the use of positive encouraging behaviours is an integral part of the learning process. This skill involves the teacher encouraging pupil's responses or any desirable behaviour by verbal statements like 'good', 'continue', etc, or by non verbal cues like a smile, nodding the head, etc.

## 5) Skill of Illustrating with examples:

The use of examples is basic to clear, good, sound teaching. Examples are necessary to clarify, verify, or substantiate concepts. Both inductive and deductive uses of examples can be made effectively by the teacher.

Effective use of examples includes: (2) starting with examples relevant to students' experience and knowledge; (3) relating the examples to the principles or ideas being taught; (4) checking to see if the objectives of the lesson have been achieved by asking students to give examples which illustrate the main point.

#### 6) Skill of Explaining:

An explanation is a set of interrelated statements made by the teacher with regard to a phenomenon, an idea, etc. in order to bring about or increase understanding of the pupils about it. In order to become an effective explainer in the classroom, the teacher should practise more and more of desirable behaviours like links, beginning and concluding statements, and testing pupils' understanding by putting a few questions. He should also avoid the use of undesirable behaviours like making irrelevant statements using inappropriate vocabulary, using vague words and phrases and lacking in continuity or fluency as <sup>much as</sup> possible.

#### 7) Skill of demonstration and experimentation:

Demonstration - which means 'to show' and experimentation which means 'to do' are practical methods of teaching involving specialised skills of much use to the vocational teacher. In order to develop or increase the understanding of concepts, principles, and so on, these methods are used. Also through these methods, planning skills, observation skills, operational skills, manipulative skills, computational skills, drawing skills and other skills of a practical nature are developed, which are very essential for success in vocational courses.

Integration of skills:- Integration of the above mentioned skills is essential to make teaching - learning process natural, lively, effective, and successful. Integration of skills may not be based on any model of integration, but the spontaneous use of the different skills by the individual teacher using his knowledge of skills <sup>is necessary</sup> when should a particular skill be used? -- The teacher has to make a number of judgements in this process. How much of a skill is to be used? Proper decisions are to be taken by the teacher depending on the subject matter to be taught taking care that no artificiality is brought about in the process.

To sum up, integration can be defined as the process through which a teacher trainee acquires the ability to perceive with precision the teaching situation in its entirety, to select and organise the teaching skills in the desired sequence so as to form effective patterns for realising the specified instructional objective, and to use them with ease and fluency.

#### Observation and feedback

The purpose of training in teaching skills is to make the trainee behave in a desired way. There may be a gap between the reality and the goal. The mechanism through which the trainee is made aware of this gap can be referred to as feedback. In order to provide a good feedback on teaching skills, valid, reliable and critical observation is needed.

Techniques of observation may be placed upon a continuum ranging from the relatively open, unstructured and unsystematic to the closed, highly structured and systematic. Rating sign system, and category system

lie at different positions on the continuum. The category type of observation schedule is used to note the frequency of occurrence of each of the teaching behaviour components and the rating type is used to mark the ratings on a seven point scale for each of the behavioural components.

The source of feedback may be any of these - self, peers, supervisors, or pupils. Mechanical devices like audiotapes can also be used as a source of feedback. The feedback can be immediate or delayed. The feedback is best given, if it is (i) analytical in approach, (ii) immediate and (iii) based on certain objectives.





## 1. OBSERVATION SCHEDULE FOR THE SKILL OF EXPLAINING:

Name of the student teacher:-

Topic:\_\_\_\_\_ Class:\_\_\_\_\_

Name of the Supervisor:\_\_\_\_\_

Date:\_\_\_\_\_ Time Duration:\_\_\_\_\_ Teach/  
Reteach.

A glossary of the key terms used in the schedule is given below.

### Explaining links:

Words and phrases (mostly conjunction and prepositions) indicating what teacher is explaining. They include the following words and phrases:-

the result	in order to	the function of
therefore	in order that	the purpose of
hence	since	the implication of
as a result	because	next
as a result of	the cause of	after
consequently	so that	before
that is why	what.....if	through
the consequence of	why	thus
due to	by	
this is how	but	

Beginning statement(s): Introductory statements made upto the point where explanation begins.

Concluding statement(s): Summary statements covering the main points in the explanation which are stated after the explanation ends.

Irrelevant statement(s): Statements not related to what is being explained and does not contribute to its understanding.

Lacking in continuity: Refers to break in the ideas or information being presented during explaining. The following are such situations.

- (i) when a statement is not logically related to the previous statement.

- (ii) when a topic already taught is referred to without showing any relationship to what is being explained;
- (iii) when there is no sequence of space or place;
- (iv) when there is no sequence of time; and
- (v) when the statements are irrelevant.

Inappropriate vocabulary: All the technical terms used are inappropriate to the particular class or age group and unknown to most of the pupils (unless teacher stops and explains.)

Lacking in fluency: All half sentences and sentences reformulated in the middle.

Vague words and phrases: Words and phrases which indicate that teacher is failing to make something explicit. (Some of them are given below.)

some	much	seems
many	something	somewhat
things	probably	the rest
a little	perhaps	almost
might	may	type of
few	in fact	actually

Includes words and phrases such as 'you see', 'okay', 'correct', etc., which form a part of teacher mannerisms.

Instructions: Mark tallies for the occurrence of instances for each of the desirable and undesirable teacher behaviours. Under each of the questions to test pupils' understanding put a tally mark if followed by correct responses.

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Desirable behaviours

Tallies

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Explaining links

Beginning statements

Concluding statements

Questions to test pupils' understanding

questions followed by correct pupil responses

Improvement in ...

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Undesirable behaviours	Tallies
Irrelevant statements	
Lacking in continuity	
Inappropriate vocabulary	
Lacking in fluency	
Vague words and phrases	

## 2. OBSERVATIONS SCHEDULE FOR THE SKILL OF REINFORCEMENT:

A glossary of the key terms is given below:

Positive Verbal Reinforcement: Includes positive verbal reinforcers like 'yes', 'excellent', 'splendid', etc. Repeating, rephrasing the pupil responses and using the ideas for further development of the lesson; extra-verbal cues like 'um hum', 'aha' to encourage and prompts like 'carry on', 'think again', etc. to help the pupils to arrive at appropriate answers.

Positive Nonverbal Reinforcement: Includes nonverbal cues like nodding, smiling, looking attentively at responding pupil, patting, etc., writing the pupil's answers on the blackboard.

Non Negative/Verbal Reinforcement: Includes nonverbal cues like frowning, staring, looking angrily at the responding pupil.

Negative Verbal Reinforcement: Includes telling the pupil directly that his answer is wrong, and sarcastic remarks.

Wrong use of Reinforcement: Includes instances where no reinforcement was given, but could have been given.

Inappropriate Use of Reinforcement: Includes encouraging remarks made not according to the quality of the response; using same type of reinforcer for every response.

Instructions: Mark tallies in the appropriate cells for the occurrence of different components of the skills of reinforcement during the lesson.

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## Components

## Tallies

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Positive verbal reinforcers

Repeating and rephrasing

Extra-verbal cues

Positive nonverbal cues

Negative verbal reinforcement

Negative nonverbal reinforcement

Wrong use of reinforcement

Inappropriate use of reinforcement

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### 3. OBSERVATION SCHEDULE FOR THE SKILL OF PROBING QUESTIONING:

The glossary for each type of probing questions is given below:

Promoting Questions: Questions where there is a hint for the pupils which helps in reaching expected response.

Seeking Further Information Questions: Questions where more information is sought, asking 'how' and 'why' of correct or wrong part of the partially correct answer.

Refocussing Questions: Questions which seek the pupil to compare the phenomenon in his response with other phenomena either for similarity or contrast or for any other relationship.

Redirected Questions: Questions which are directed to more than one pupil for response.

Increasing Critical Awareness Questions: Questions which seek 'how' and 'why' of a completely correct or expected response.

Instructions: Mark tallies for each of the probing questions in appropriate cells as they occur during the lesson.

Components	Tallies
prompting	
seeking further information	
refocussing	
redirection	
increasing critical awareness	

#### 4. OBSERVATION SCHEDULE FOR THE SKILL OF FLUENCY IN QUESTIONING:

Components	Tallies
<u>Structure:</u>	
Questions were grammatically correct.	
Questions were relevant to the topic.	
Questions were specific.	
Questions were concise.	
<u>Process:</u>	
Questions were put with proper speed and pause.	
Questions were put to the class with proper voice.	
<u>Miscellaneous:</u>	
Questions were not repeated unnecessarily.	
Responses to the questions were not repeated.	
<u>Fluency:</u>	
The teacher could put sufficient number of questions in this lesson.	

## 5. OBSERVATION SCHEDULE FOR THE SKILL OF STIMULUS VARIATION:

The glossary of the key terms is given below:

Movements: Movements from one place to another which seem to encourage useful shifts for attention (e.g. movement towards blackboard to discuss the diagram drawn on it).

Gestures: Movement of head, hands, and body to direct attention, to emphasise importance, to express emotion, or to indicate shapes, sizes, movements, etc.

Change in speech pattern: Sudden or radical changes in tone, volume, or speed of the teacher's speech.

Focussing: Verbal, gestural or verbal-gestural focussing.

Change in interaction styles: Change in interaction styles, from one to another (i) teacher-group, (ii) teacher-pupil, and (iii) pupil-pupil.

Pausing: Short deliberate intervals of silence used while conveying information, lecturing, explaining, etc.

Oral-visual switching: Change in the medium-oral, visual or oral-visual through which information is conveyed to pupils, indicate a change if there is any of the following changes in the media.

- |       |        |             |
|-------|--------|-------------|
| (i)   | oral   | visual      |
| (ii)  | oral   | oral-visual |
| (iii) | visual | oral-visual |

Instructions: Mark tallies in appropriate cells as they occur during the lesson.

Components	Tallies
Movements	
Gestures	
Change in speech pattern	
Focusing	
Change in interaction-styles	
Pausing	
Oral-visual switching	

## 6. SCHEDULE FOR OBSERVATION OF SKILLS OF DEMONSTRATION AND EXPERIMENTATION:

Instructions: Mark the tallies for the occurrence of the instances under each component during the lesson.

Components	Tallies
1. Planning	
2. Observation	
3. Operation	
4. Manipulation	
5. Computation	
6. Drawing	
7. Drafting	

## 7. INTEGRATION OF SKILLS PRACTISED:

Instructions—Mark the tallies in appropriate cells as they occur during the lesson.

Skills	Tallies
1. Skill of Stimulus Variation	
2. Skill of fluency in questioning	
3. Skill of probing questioning	
4. Skill of reinforcement	
5. Skill of explaining	
6. Skill of illustrating with examples.	





CLASSROOM QUESTIONING

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Education is an important aspect of life, and successful teaching is the soul of education. Similarly, questioning is the soul of teaching. Proper questions in the classroom stimulate thinking among pupils. Furthermore, proper questions are needed to make the lesson more interesting and secure and sustain the attention of students.

I. CHARACTERISTICS OF QUESTIONS:

Following are the characteristics of good questions:

1. Question should be relevant

An irrelevant question is that which is not related to the topic or related to it only remotely. Such questions break the continuity of the lesson, divert pupils' attention and create confusion in the classroom. For example:  
(Irrelevant question)

Teacher: What is a Noun?

Pupil: - - -

Teacher: Which word is a noun in this sentence?

Pupil: Allahabad

Teacher: Have you visited Allahabad?

Pupil: Yes

Teacher: Good. It is a beautiful city.

2. Questions should be concise;

It refers to the length of questions. Direct Straight forward questions are always better. Unduly long questions cause wastage of time and diversion of pupils' attention. For example:

Teacher: Will anyone of the back benchers tell me as to what is the name of the President of India who is the highest authority in this great democratic country?

### 3. Question should be clear

Clarity refers to the understandability of the language of questions. Simple language and appropriate words, according to the understanding level of students, should be used.

### 4. Question should be grammatically correct:

It is desirable for the teacher to use grammatically correct language. If the language used by the teacher is wrong, it will create confusion in the minds of pupil and they will spend more time to understand it.

Following are the precautions which should be kept in mind while framing the questions:

#### (i) Avoid questions requiring Yes or No answers

This type of questions do not stimulate thinking in the pupils. Such questions have high scope for guessing and the teacher cannot assess the originality of answers. In order to assess the exact position, he is to ask supplementary questions which involve wastage of time.

#### (ii) Avoid the use of leading questions

In leading questions, expected answers are echoed and, moreover, the answer is in 'Yes or No' form. It is a spoonfeeding approach as a result of which the pupils will become lethargic and start responding without thinking.

Example - India got freedom in 1947, Didn't it?

#### (iii) Avoid Elliptical questions

Questions which require completion to get the answers are elliptical questions. For example,  
Mount Everest was conquered by .....?

#### (iv) Avoid Suggestive questions

In suggestive questions, the teacher teaches one particular concept or sub-concept of a lesson to his pupils. He

immediately asks questions from the same portion. For example :

Teacher: India is a democratic country. It has many states. Delhi is the capital of India.  
Now tell me what is Delhi?  
Pupil: Delhi is the capital of India.

Such questions do not develop any thinking or reasoning among the students.

(v) Avoid double barrelled questions

Questions that include two or more ideas for pupils to consider at the same time are called double-barrelled questions. For example:

Teacher: What is velocity and how does it differ from speed?

A proper question is that which presents a single idea before the pupil to consider. Double barrelled questions (for example) could be broken into two or more questions.

Teacher: (Q1) What is velocity?  
(Q2) How does it differ from speed?

(vi) Avoid ambiguous questions

Ambiguous questions include elliptical or 'what about' kind of questions. Such questions are vague and fail to communicate the intent of the question.

Teacher: What about England?  
What about Agriculture?

A teacher will fail to communicate the idea if he uses a question of this type.

## II. Process of Questioning

A teacher structures various questions in relation to the objectives of the lesson keeping in view the different characteristics of questions. These questions should be communicated to the pupils keeping in view the following components:-

(i) Speed of asking questions

The teacher should speak out questions neither too hurriedly nor too slowly. Considering the level of aural and oral development and pupils comprehensibility. Besides, the speed of asking a question should also be adjusted according to the level of thinking required to answer it.

(ii) Voice

The teacher should pay adequate attention to his voice, its pitch, modulation and intonation. The question should be audible and clear to all the pupils in the class.

(iii) Pause

Pause refers to the small periods of silence observed by the teacher just after delivering a question so that the students get time to think and formulate an appropriate answer.

(iv) Avoid Repetition of Questions(v) Avoid repetition of Answers given by pupils(vi) Distribution of Questions

The questions should be distributed in the whole class. The distribution of classroom questions can be considered along the lines, namely distribution in terms of classroom space, distribution among volunteers and non volunteers, and redirecting the same question to other pupils for increasing pupil participation. Proper distribution of classroom questions helps in securing and maintaining pupils' attention, enlists their active involvement in the teaching-learning task and also creates interest in the learning task.

III. Probing Questions

The strategy of asking questions is directed to elicit responses from the pupils. When a question is put in the classroom, there are a number of possible pupil response situations such as no response, wrong response, partially correct response, incomplete response or correct response.

The skill of probing questioning means going deep into pupil responses through step by step questioning with a view to eliciting the criterion response. Let us consider various components of the skill.

(i) Prompting

This involves the teacher to give clues or hints to the pupil and ask leading questions. The teacher neither supplies answer to the pupil nor does he redirect the question to some other pupil, but helps the pupil to answer the question himself. In other words, it is a hint or clue which help the pupil to arrive at the correct response. This technique is used when the response of pupils is 'no response' or 'wrong response'. For example:

Teacher: How will the climate be affected when the sun disappears from the solar system?

Pupil: No response.

Teacher: Has it anything to do with day and night? (clue)

Pupil: There will no day and night.

Teacher: Very good. How will the temperature be affected? (Clue).

(ii) Seeking Further Information

If the initial response of a pupil is either incomplete or partially correct, then the teacher helps the pupil to clarify, elaborate, or explain his initial response. Here, the teacher elicits more information and meaning or seeks further clarification from the pupil by asking questions like:

(a) What do you mean by the term 'Education' used by you in this statement?

(b) Can you put it in other words?

(c) Can you clarify your answer further?

(iii) Refocussing

This technique is generally used when the pupil gives a correct response. For this, he refocusses pupil's response and asks the pupil to relate it with something already learnt or its implications in more complex and novel situations.

For example:

- (a) In what way is this different from.....?
- (b) How does it relate to.....?

(iv) Redirection

Redirection technique involve putting or directing the same question to several pupils for response. For example:

Teacher: What are the characteristics of living things?

Rani: No response.

Teacher: Sunitha? (Redirection)

Sunitha: They reproduce.

Teacher: Yes, any other? Rama? (Redirection for seeking further information)

Rama: They have .....

(v) Increasing critical Awareness:

This technique mainly involves asking 'how' and 'why' of a correct response. This technique is used to increase critical awareness in the pupils. For example:

- (a) How do you say so?
- (b) What are you assuming here?

Conclusions:

Classroom questioning is an important art through which a teacher can increase his effectiveness. The questions should be relevant, precise, clear and grammatically correct. The questions should be put in a proper way to all the students. The teacher should use different components of the skill of 'Probing Questions' to reach at the criterion response.

CLASSROOM INTERACTION

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Introduction:

'Education is a conscious and deliberate process in which one personality acts upon another in order to modify the developments of the other by the communication and manipulation and knowledge.'

-Adam

Education is a process of bringing about a desirable change in the behaviour of a child in terms of knowledge, skills, attitudes, values and appreciations. For the effective organization of this process, the teacher should be in touch with new trends in education and should try out new ideas, programmes and techniques experimentally, and make a scientific inquiry into their validity, utility and worth-whileness under school conditions. The programme of experimentation for educational improvement has to be planned in the context of the quantitative expansion of education throughout the country. The emphasis has to be on qualitative improvement which obviously has not received adequate attention of the administrators in this field.

Today, one of the acute problems of education in our country is the low level of scholastic achievement of school children at the primary and secondary stage of education. Pupils' achievement is considered an index of the quality of education. In this regard, the present state of affairs in our country is not encouraging. This low level of scholastic achievement of school children has invited attention of eminent educationists and research workers who have attempted to find the causes of this problem and suggest some remedial measures. The Report of the Education Commission (1964-66) proposes a programme of reconstruction so that qualitative improvement of





education in India may be possible. It also advocates adequate standards of achievement at all levels of education. The Report of the Educational Commission (1964-66) stimulated the administrators and researchers to initiate a number of programmes which would lead to improvement of education in general, and classroom teaching in particular.

Of all the factors influencing classroom instruction, teacher behaviour is considered to be the most important. Instructional methods, text-books and all such facilities do contribute to a programme of improvement of classroom teaching, but these will not be effective in the absence of a competent teacher endowed with the right type of skills to make the teaching-learning process lively and effective. Today, the educational world is facing a dilemma where it has to select the allocation of scarce resources either for the development of educational hardware, i.e. text-books, instructional materials, teaching aids etc. or the development of human resources, namely teachers in the classroom.

The teacher occupies a leadership position in the classroom. Teacher behaviour plays a major role in determining pupils' achievement, pupils' growth and development. The study of the teacher and his classroom behaviour, therefore, is of paramount importance.

The Education Commission (1964-66) states: 'The destiny of India is now being shaped in her classrooms'. Whatever may be the efforts to change school practices, ultimately, it comes down to the teachers' classroom behaviour, his teaching and the teacher-pupil interaction. The interaction between the teacher and the pupils creates the climate of freedom or restriction for the pupils in the classroom. Not much attention has been paid in studying and analysing the teachers' classroom behaviour. Classroom in a school, as a unit of interaction amongst the pupils, and between the teacher and the pupils, plays an important part in the development of the child. The teacher has the great deal of influence on pupils.

It has been shown by several studies that through the process of internalization of the influence pupils' behaviour is shaped to a great extent, a kind of classroom climate is created, by the kind of influence the teacher exerts.

### Classroom Communication - The Need

The classroom in a school, as a unit of communication and interaction between teacher and pupils and amongst pupils, can be said to play an important role in determining the achievement of pupils. The recent researches, as mentioned in the\*, have focussed on what goes on in the classroom by way of interaction between the teacher and the pupils as also among the pupils themselves. Classroom interaction is the process of verbal interchange between the teacher and the pupils and also amongst the pupils themselves. It is the process through which the teaching-learning task takes place. Effective teaching is said to occur when the teacher and the pupils interact with each other and also when the pupils interact amongst themselves. The interaction in the classroom is usually teacher-initiated as the teacher occupies the leadership position in the classroom. The study of classroom interaction, therefore, would be no significance without observing classroom behaviour of the teacher and its implications. Classroom interaction and teacher behaviour are the interdependent, that is, functionally related to each other.

### Classroom Climate:

It is a widely accepted fact that living in a society requires a kind of school experience for children which emphasises social values. This has generally been taken to mean that school situations, especially in the classroom must be modelled along democratic principles. Hence, this general position has important implications

\* following paragraph

thods. With this point of view in-mind, developed his theory of democratic interaction. The idea is that the classroom situation is shaped by an atmosphere of democratic interaction. The classroom situation has been variously described by authors. The terms like 'Classroom Climate' and 'Classroom Interpersonal Climate' have been coined by different workers for classroom situations.

The term of classroom climate or psychological climate has been used by many researchers besides Lewin and Lippitt (1943) in the area of psychology. Prescott (1938), Lewin (1948) and others, for example, have made considerable use of the term.

However, it is difficult to assign a precise definition of the concept. For the purpose of communication and clearer understanding of the concept, a definition of the term social-emotional climate has been attempted.

Classroom climate may be considered to represent the atmosphere which is a concomitant of inter-personal interaction. It is a general emotional factor which is present in interactions occurring among individuals in face to face groups. It seems to have some relation to the degree of acceptance expressed by individuals regarding each others' needs or goals.

'Classroom Climate' refers to the generalized atmosphere created by the teacher and the class that the pupils develop, in spite of individual differences. It develops from the classroom social interaction. In participation in classroom activities, pupils develop some common expectations regarding the teacher and their collective attitudes towards their own class. These expectations influence the classroom climate.

the social atmosphere that appears to be markedly distinct and fairly stable, once established. Thus, 'Classroom climate' refers to those qualities that consistently predominate in most teacher-pupil contacts. Hence, the study of teacher behaviour through interaction analysis becomes a study of classroom climate, as well (Flanders, 1970).

Lewin (1948), in his discussions on his exploration of group life and interpersonal relations, uses the concept of group dynamics. The phrase 'classroom dynamics' is the ornamental term of the concept of classroom interaction.

Classroom interaction analysis is a technique which facilitates capturing qualitative and quantitative dimensions of teacher-student verbal behaviour in the classroom. This technique has its limitation-it does not measure everything that goes on in the classroom. Interaction analysis is concerned with the verbal communication between the teacher and the students. Flanders (1966) developed this technique out of a social-psychological climate of the classroom communication on student attitudes and learning. In fact, classroom teaching is a social interaction. The teaching acts produce reciprocal contacts between the teacher and students, and this interchange is called teaching.

In various studies, different terminology has been used for the same behaviour patterns. They were, for Anderson et al., (1939) 'dominative vs. integrative', for Lippitt and White (1939) authoritarian vs. democratic for

Withall (1949), Flanders (1961) and Perkins (1950) 'teacher-centred' vs. 'student centred' and for Cogan (1956) 'preclusive vs. inclusive'. Later on, Flanders (1965) introduced his nomenclature - 'direct vs. indirect' teaching behaviour.

Classroom climate helps to identify clearly the two teacher behaviour patterns. Studies cited do not suggest that there is a single pattern of teacher behaviour that should be continually maintained in the classroom. Teaching experience does support the situations where dominative teacher behaviour is appropriate. The works of Anderson et al. (1940), and Cogan (1956) provide evidence that a desirable climate results in more learning although further evidence is needed to confirm the aforesaid conclusion. Flanders (1967) has also suggested that at times direct influence is appropriate and at other times, indirect influence.

All these studies listed above indicate directly or indirectly, that the teacher behaviour in the classroom determines to a great extent how much impact the teacher is going to have on his students and in what direction. These studies also suggest that democratic or integrative teachers produce students with comparatively high achievement and good personality characteristics than teachers showing authoritarian or dominative behaviour.

#### Flanders Interaction Analysis Category System (FIACS)

Of the several observational tools developed (Anita Simon and Boyer Gil 1968) the system developed by Flanders is found suitable for use in Indian Classroom situation.

Flanders' interaction analysis instrument consisting of ten categories is designed for observation only of verbal communication in the classroom and non-verbal gestures etc. are not to be taken into account.

The chief purpose of observation of classroom 'teaching learning' process, using Flanders' device is to identify the patterns of teacher behaviour. It has been established that teacher classroom behaviour, to a large extent, set, sets the 'climate' in the classroom and conditions learning of the students.

In the Flanders' observation system of interaction analysis all teacher statements are classified first as either indirect or direct. This classification gives central attention to the amount of freedom the teacher grants to the students. In a given situation therefore, the teacher has a choice. He can be direct, minimising the freedom of the student to respond or be indirect, maximizing the freedom of the student to respond. His choice, conscious or unconscious, depends upon many factors, among which are his perceptions of the classroom interaction and the goals of the particular learning situation.

In order to make total behaviour or total interaction in the classroom meaningful, Flanders' system also provides for the categorization of student talk. A third major section, that of silence or confusion, is included in order to account for the time spent in behaviour other than that which can be classified as either teacher or student talk.

All statements that occur in the classroom are then categorised in one of the three major sections:

(i) teacher talk, (ii) student talk, and a separate category, (iii) silence, confusion or anything other than teacher or student talk. Category systems like Flanders' which exhaust all possibilities are

'totally inclusive' of all possible events and since every possible event can be classified, a totally inclusive system permits coding at constant rate throughout the observation.

The sections of teachers' and pupils' verbal behaviour are further subdivided in order to make the total pattern of teacher-pupil interaction more meaningful. The two subdivisions for teacher verbal behaviour, indirect and direct teacher talk, are further divided into various categories. Indirect influence consists of four observation categories:

- (i) accepting feelings,
- (ii) praising or encouraging,
- (iii) accepting ideas and
- (iv) asking questions.

Direct influence is divided into three categories

- (v) lecturing,
- (vi) giving direction and
- (vii) criticizing or justifying authority.

Student talks is divided into only two categories:

- (i) responding to teacher, and
- (ii) initiating talk.

All categories are mutually exclusive, yet together they are totally inclusive of all verbal interaction occurring in the classroom.

A summary of categories with brief definitions for use of the observer, is given below:

#### CATEGORIES FOR INTERACTION

- 
- |              |  |
|--------------|--|
| TEACHER TALK | <ol style="list-style-type: none"><li>1. *ACCEPTS FEELING: accepts and clarifies the feelings tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.</li><li>2. *PRAISES OR ENCOURAGES: praises or encourages students' action or behaviour. Jokes that release tension, not at the expense of another individual, nodding head or saying "um hum"? or "go on" are included.</li></ol> |
|--------------|--|

INDIRECT  
INFLUENCE

3. \*ACCEPTS OR USES IDEAS OF STUDENT: Clarifying, building or developing ideas suggested by a student. As a teacher brings more of his own ideas into play, shift to category five.

4. \*ASKS QUESTIONS: Asking a question about content of procedure with the intent that a student answer.

5. \*LECTURING: giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions.

TEACHER TALK

6. \*GIVING DIRECTIONS: directions, commands, or orders to which a student is expected to comply.

DIRECT

INFLUENCE

7. \*CRITICIZING OR JUSTIFYING AUTHORITY: Statements intended to change student behaviour from non-acceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.

8. \*STUDENT TALK RESPONSE: a student makes a predictable response to teacher. Teacher initiates the contact or solicits student's statement and sets limited to what the student says.

STUDENT TALK

9. \*STUDENT TALK-INITIATION: talk by students which they initiate. Unpredictable statements in response to teacher shift from 8 to 9 as student introduces own ideas.

SILENCE OR  
CONFUSION

10. \*SILENCE OR CONFUSION: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

\* There is no scale implied by these numbers. Each number is classificatory it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge, a position on a scale.



### Observation Procedures:

The observer sits in the classroom in the best position to hear and see the participants. At the end of each three-second period, he decides which category best represents the communication events just completed. He writes this category number down while simultaneously assessing communication in the next period, and continues at a rate of 20 to 25 observations per minute, keeping his tempo as steady as possible. His notes are merely a sequence of numbers written in a column, top to bottom, so that the original sequence of events is preserved. Occasionally marginal notes are used to explain the class formation or any unusual circumstances. When there is a major change in class formation, a double line is drawn and the time indicated. As soon as the total observation is completed, he retires to a nearby room and completes a general description on each separate activity period indicated by the double lines, including the nature of the activities, the class formation, and the position of the teacher. The observer also notes any additional facts, that seem pertinent to an adequate interpretation and recall of the total observation period.

### Tabulation of Matrix:

A trained observer records his data as a series of numbers. For example, the school bell rings and the following interaction occurs.

The numbers written down by the observer are indicated in brackets.

Teacher: "Class! The bell has rung. May I have your attention please! (6)

During the next three seconds talking and noise diminish. (1)

Teacher: "Rama, we are all waiting for you". (7) pause.

Teacher: "Now, today we are going to have a very pleasant surprise, (5) and I think you will all find it very exciting and interesting. (1) Have any of you heard anything about what we are going to do?"

Pupil: "I think we are going on a trip in the bus that is out in front." (8)

Teacher: "Oh! You've found out! How did you learn about our trip?" (4) etc.

The observer has written down 6, 10, 7, 5, 1, 4, 8 and 10. As the interaction proceeds the observer will continue to write down numbers. To tabulate these observations in a 10 X 10 matrix, the first step is to make sure that the entire series begins and ends with the same number. The convention we use is to add a ten to the beginning and end of the series unless the ten is already present. Our series now becomes 10, 6, 10, 7, 5, 1, 4, 8, 4 and 10. This procedure is followed in order to produce a finished matrix in which the sum of column one equals the sum of row one, the sum of column two equals the sum of row two, in short, so that the sum of columns and rows are equal, respectively.

The number ten is used because it will affect the interpretation or teacher influence the least. One of our less sympathetic critics suggested, however, that this convention is necessary in order to begin and end an observation in confusion.

The numbers are tallied in the matrix one pair at a time. The column is used for the second number, the row is

used for the first number. The first pair is 10-6: the tally is placed in the row column six cell. The second pair is 6-10: tally this in the row six column ten cell. The third pair is 10-7: the fourth pair is 7-5, and so on as shown in Sample Interaction Matrix.

	1	2	3	4	5	6	7	8	9	10	Totals
1				1							1
2											0
3											0
4								1	1		2
5	1										1
6									1		1
7					1						1
8				1							1
9											0
10						1	1				2
TOTAL	1	0	0	2	1	1	1	1	0	2	9
O/O											

The Interpretation of 10 X 10 Matrix:

Perhaps the most exciting part of this system of observation is the large number of interpretations and explanations that can be made from a matrix that are directly relevant to assessing teacher influence. Some of these interpretations are discussed here. The pattern of interaction that the teacher has used with the class is given below in typical illustration matrix.

# A Typical Illustration

	1	2	3	4	5	6	7	8	9	10	
1					1				2		
2		4	1					13			
3		1	6	1				3			
4			1	14				5			
5	1				48			6			
6						1		4			
7							4		1		
8		2	2	5	6	4		11			
9	1						1		5	1	
10									1	9	MA- TIV T-10
TOTAL	3	7	10	20	56	5	5	30	12	3	15
$\frac{1}{10}$	2	$4\frac{1}{2}$	$6\frac{1}{2}$	$12\frac{1}{2}$	$20\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	20	5	2	

Teacher Talk

Columns 1-7 = 105

105 150 = 70%

Student Talk

Columns 8-9 = 42

42 150 = 28%

The total percentage of teacher talk is of prime importance in interpreting matrix. It is found by dividing the total number of tallies in Column 1 through 7 by the total number of tallies in the matrix. There are 150 tallies in a matrix, 105 of which are in columns 1-7. This teacher talked 70 percent of the total time of the observation. To find the percentage of student talk, the total number of tallies in columns 8 and 9 is divided by the total number of tallies in the matrix. There are 42 tallies in columns 8 and 9 hence the students talked 28 percent of the time. A total of three tallies in column 10, when divided by 150, shows that 2 per cent of the time was spent in silence or confusion.

Next the observer finds indirect and direct influence of the teacher from the matrix, by computing the number of tallies in columns 1, 2, 3 divided by the number of tallies in columns 6 and 7. Categories 1,2,3,6 and 7 are more concerned with motivation and control in the classroom and less concerned with the actual presentation of subject matter. This ratio gives the information about whether the teacher is indirect or direct in his approach to motivation and control. Likewise many communication patterns in the classroom can be calculated with help of the tallies loaded in different columns of the matrix.

#### Concluding Remarks:

This technique of quantifying the qualitative aspects of verbal communication is used to measure teacher influence. This can also be used as training technique. Teachers can be

taught enough about interaction analysis in 4 to 8 hours to apply it to their own tape recordings or to act as an observer when invited to do so by another teacher. The discussions that result can provide the participants with new insight in their own or the colleagues' behaviours. Apparently teachers have great interest in and need for objective information about their patterns of influence, how these patterns match their intentions, and whether the differences they expected from different patterns did or did not occur.

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How to write the Aims and Objectives of Teaching the  
Repair and Maintenance of Electrical Appliances Course

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- D. THOMAS SELLARAJ  
Assistant Director

Aims and objectives are important for teachers. They are important because, they are the starting point for any endeavour including the designing of a vocational education course. For Example, if we want to go somewhere and purchase something, we need to know where we are going, how we are going and what we really want. Without this necessary information we may not reach the proper place, nor get what we want.

Teachers need teaching aims and objectives. AIMS give an idea what we want the students to be at the end of a course and objectives give an idea how we are going to achieve the aim. Clearer the aims and objectives, the easier the task of designing the teaching.

Teaching aims and objectives are not the same thing. An aim is a general statement which may probably be some what vague and ambiguous. Aim tend to be all-embracing ideals which are probably un obtainable in their entirety. In an attempt to be realistic and precise, the teacher will translate the aims into an objectives.

An objective will state in as precise way as possible the goal for a particular set of materials in terms of what the student will be able to do. An ideal objective makes provision for measurement, i.e. the success of material produced can be seen in light of its ability to help the students to achieve the objectives.

Educational Aims:

Although aims are general statements, they should be stated as clearly as possible. To do this, they should give indications of what the learner would or could be able to do at the end of the training.

Aims can be expressed in either teacher oriented terms or student behaviour terms.

The teacher oriented aim is one in which the teacher states what he expects to be able to achieve at the end of the teaching.

Examples of teacher- oriented aims

- 1) To train the students to carry out a complete overhaul of a simple electric washing machine.
- 2) To illustrate different type of connections in the electrical cooking ranges.
- 3) To teach about job analysis for the electrical appliances repairer occupation.
- 4) To provide new instructors with sufficient knowledge and practice to enable them to use the lesson plan.

Examples of student-oriented Aims:

The same aims rewritten in student behavioural terms look like this:-

- 1) At the end of the training the student will be able to carry out a complete overhaul of a simple electric washing machine.
- 2) At the completion of the lesson the students will be able to illustrate different types of connections in the electric cooking range.



- 3) At the end of the lesson, the trainee instructors will be able to carry out job analysis for the electrical appliances repairer occupation.
- 4) On the completion of the lesson the untrained instructors will be able to use the lesson plan effectively.

The aims in student behaviour terms are rather more specific than the teacher oriented aims; but neither are as specific or precise as training objectives. The aims are, however, a starting point, they give us very useful clues as to what needs to be achieved in the course.

Let us write the aims of the "Repair and Maintenance of Electrical Appliance Course" in teacher oriented-terms:-

- 1) To train the students to repair and maintain electrical appliances. The same is written in student behavioural terms as:
  - a) At the end of the training, the students will be able to maintain and repair electrical appliances.

Educational Objectives: As educational objective is a clear, precise statement of what the student will be able to do at the end of the course. Educational objectives are far more detailed than aims. They contain quite separate parts as stated below:-

- 1) Performance      (2) conditions      (3) standards

1) Performance:- This refers to statement of the action the student would or could be able to do at the end of the period of education. Active words are preferable as stated below:-

- a) he will state
- b) he will calculate
- c) he will list
- d) he will identify
- e) he will demonstrate
- f) he will select
- g) he will solve
- h) he will write
- i) he will distinguish between
- j) he will match
- k) he will repair, etc.

2) Conditions: The conditions under which the performance will be carried out in the job situation, refer to what the student is provided with or denied in the job situation. Generally speaking, five types of conditions should be considered:-

- the range of problems the student must solve.
- the tools, equipment and clothing to be used.
- any special job aids and manuals he is provided with
- environmental conditions
- any special physical demands.

3) Standards:- The standard of performance the student must achieve comprises three main parts. They are

- accuracy
- speed
- quality

Statements that can be interpreted in a variety of ways must be avoided at all costs. For example

- will understand ohm's law

(What is understand?). Is he expected to state ohm's law or just name the founder, or has he to be able to find the relation between pressure. Current and resistance.

- will have a working knowledge of a electrical cooker

What is working knowledge?

---- will appreciate the need of safety

What is meant by appreciate?

---- will know the theory of electromagnetism

What are the limits of knowing?

In conclusion we can say that the objective has to be stated in precise measurable active term. It should clearly indicate the level of learning aimed at, the equipment tools to be used, manuals to be referred, and what environmental and physical conditions the job will be carried out. In addition, the objective should indicate at what accuracy and speed the job will be carried out and what will be the quality of the end product.

#### Writing Educational Objectives:

Now let us make a fair trail to write the objectives for the aim. " At the end of the training, the students will be able to maintain and repair electrical appliances".

In order to achieve the above aim the students should know the uses, basic principles, operations and working of the common electrical appliances used in homes. He should be able to read diagrams and identify the parts or vice versa. He should be able to use electrical testing equipment like megger etc, and to diagnose faults in the appliances. He should also know the specification of parts for replacement. He should follow safety precaution as per Indian Electricity rules and his own safety methods.

As the course is terminal in nature, he must be able to engage in the sale and service of electrical appliances, for which he should possess acceptable personality traits



Competency - based Curriculum for Vocational Course

- D. Thomas Sellaraj

The terms syllabus and curriculum, are often used synonymously to denote an out-line of practical training and related instructions required for the acquisition of a specific level of skill and knowledge in a particular occupation. It may indicate the time to be devoted to each part of the training and the order in which the items are to be learnt.

But there is a basic difference between the syllabus and the curriculum. The syllabus clearly indicates the precise information regarding the amount of skill and knowledge to be imparted by the teacher to the student in each subject during the period of training. The curriculum, on the other hand, in addition to above, is designed to provide an individual trainee with the best possible training and learning experiences to qualify him for a particular trade or occupation. The curriculum as such is the means of attaining the aims and objectives of the training.

Competency means the ability (including knowledge, skills and attitudes) to perform a specific task or duty successfully. Competency based vocational curriculum is a means of instruction which (a) identifies the competencies needed for on-the-job performance, (b) and informs students and teachers of the precise and detailed learning objectives and experiences required to achieve these competencies.

The assembly of instructional units into courses of study and the combining of courses in logical sequence is the essence of curriculum development and construction, whether it may be for elementary, secondary, college or any other educational programme. In the development of a curriculum for vocational and technical education, however, there are a number of factors which complicate the process. For example, designing the curriculum for a simple occupation is easier than for a cluster of occupations. Further complication arises because of varying job requirements of employers in the same industry both locally and nationally. Therefore, the vocational education planner should not only determine the job contents in terms of skills and knowledge requirements of an occupation, but should also rationalise the instructional programme to meet the current and future needs of majority of the employers. The curriculum prepared should accordingly be based on minimum competencies required for the particular occupation.

To formulate a vocational course, the following procedure is adopted:

- 1) Job-analysis is done under which job opportunities are listed and tasks under each job are identified.
- 2) Tasks are analysed into skills, knowledge and personality traits.
- 3) The target population is identified.
- 4) Course objectives are determined.
- 5) Based on objectives, the curriculum is prepared.

The first step in the direction of identification of minimum competencies in a particular vocational course

is listing of the job opportunities. Identification of job opportunities shows what openings or avenues are available to students after completing the course and what is expected of them. It helps to assess the importance of a course. It helps to prepare a list of duties to be performed under each job. The scope and content of the course can be derived directly from job analysis. The contents of even related subjects are to be chosen as directly related to be vocational subject. Therefore, the first step in this direction, is to determine the job opportunities. For example, the following job opportunities are available for vocational students after completing repair and maintenance of electrical appliances course:-

a) Wage employment

- 1) Servicing and repairing of domestic electrical appliances in service shops.
- 2) Job in a domestic electrical appliances factory, assembly line/quality control shop.
- 3) Servicing and repairing of domestic electrical appliances in hotel industry/hostels.
- 4) Winding AC+DC motors.

b) Self employment in:

- 1) Dealership/agency of domestic electrical appliances.
- 2) Service centre of domestic electrical appliances in rural and urban areas.
- 3) Mobile service centre for servicing domestic electrical appliances.
- 4) Service and sale of spares  
of
- 5) Manufacturing/domestic electrical appliances.
- 6) Manufacturing of spares for domestic electrical appliances.  
of
- 7) Winding/electrical motors.

### Task Analysis

To train a person to do a job successfully, we must first break down the job into duties or tasks. We must state exactly what the person must do in observable and measurable terms.

For example, an electrical appliance repairer is required to know or do the following:-

- 1) the principles of working of electrical appliances,
- 2) study the service manual, block diagrams, schematic diagrams, and wiring layouts.
- 3) the probable causes of defects in electrical appliances
- 4) to carry out the repair and, if necessary, replace defective items in electrical appliances,
- 5) to test, adjust and align the electrical appliances.

### Listing of Objectives

Just as the job is to be broken down into tasks to provide enough details, the tasks, in turn, should be broken down into knowledge & skills. The development of correct attitudes or personality traits by the trainee must also be considered. The main emphasis here is to identify cognitive, affective and psychomotor abilities and skills needed for the course.

After analysing the knowledge, understandings, skills, attitudes and personality traits required for the occupation, the target population for the course should be determined. 'Target population' is the word used to specify, select and appraise the people to be trained.

Next to be determined are the course objective, which provide the starting point of the curriculum. The course content, the teaching-learning methods, strategies and



experiences, the practical work and on-the-job training, the text books, instructional materials and aids and the <sup>and</sup> plan/procedures of pupil evaluation are all to be based on the course objectives. The curriculum being much more comprehensive/inclusive than a syllabus, it specifies all the above-mentioned components which help to provide necessary learning experiences to vocational students in a planned, <sup>and</sup> systematic/organised way.

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# METHODS OF TEACHING THE VOCATIONAL COURSE IN REPAIR AND MAINTENANCE OF ELECTRICAL APPLIANCES

D. Thomas Sellar

It is true that the teacher engaged in vocational education should not only know his subject well, possess the requisite skills and personality traits, but he also must know how to impart the knowledge skills, and personality traits to his students effectively.

Imparting of knowledge, skills and personality traits is called the methodology/methodics of teaching.

In order to follow the methodology the teacher should have considerable knowledge about learner's psychology and aims and objectives of the course, target population, facilities available like equipment, tools materials and text books, his own level of knowledge, and the environment of the institution.

A teacher method is regarded as the basic, approved mode of instruction. Using the correct method of teaching, every objective of the course can be achieved from simple to complex.

Some methods of teaching vocational subjects are described below:-

Unit Method: A unit may be defined as a sum total of similar experiences related to one particular aspect of the subject (knowledge) or a particular skill. A unit should have relationship with the whole course-outline of the subject. A method using units is known as the unit method.

Project Method: A project is a problematic act carried to completion in its natural settings. It is directed towards the learning of a skill, a group of skills or a process. A method using projects is known as the project method.

Problem solving method: Problem solving method is just like project method with a difference that the former emphasises the mental solution of a task while the latter its practical accomplishment. This needs careful planning by the teacher.

Demonstration method: Demonstration method is one of the most useful and valuable methods for vocational education subjects. It is used for the development and improvement of techniques and skills involved in the performance of a task. Demonstration is a technique of showing how a task is done with a view to developing skills among the learners. The teacher demonstrates and the students observe it and perform the task as the teacher aid.

Field trip as a method:

The field trip is a process of going out of the school to the world of work and observing it under the guidance and the supervision of the teacher.

Exercise method:

Particular skills which are repeated in the jobs of an occupation are first classified and given to the students as exercises. Example:- 1. Soldering of joints

2. Measurement of wire gauges

Job work method: A job is designed to incorporate a number of skills involved in the occupation. This may have some commercial value or otherwise. Job sheets are given by the

teacher to students to follow the sequence of operation.

#### Implant apprenticeship:

Student is sent for a particular period to get training, in a workshop, factory or service centre, under supervision of trained personnel.

#### Lecture method:

This method is used to impart knowledge about principles of working of equipment in a classroom. It is supported by information sheet for students and lesson plan for teachers.

Case study method: Students are asked to study a work situation and give a study to solve problems economise the expenditure and follow easy operations.

#### Programmed Learning method:

This is more effective when the student is an adult having sufficient maturity. This comprises of information followed by questions. If the student is able to answer correctly the questions he is allowed to study the next lesson and so on. Otherwise he is instructed to read the information again and again until he is able to answer the questions correctly. No teacher is required but the student studies in his own phase.

#### Discussion method:

Group discussions of the students will help them to enrich their knowledge. Needs proper planning for execution.

#### Tutorial method:

Students who are slow in learning process can be grouped by the teacher to tutorial classes. Where teacher teaches at a reduced speed and proper sequence.

## Gaming & Role play methods:

These methods when properly designed will change the attitude of students. But these methods also need careful planning and execution.

The following list may help to guide the choice of the method.

When objective is development of manipulative skill	When objective is to impart knowledge	When objective is to change attitudes
Demonstration lesson method.	Lecture method	Gaming, case study,
Exercise method	Unit method	Role play, discussions, tutorials.
Job work method	Case study method	
	Programme learning method	
Implant apprentice method	Discussion method	
Project method	tutorial method	
Field trip method	Problem solving method	

The following table will help in selecting appropriate instructional materials/aids.

Skills	Knowledge	Attitude
Demonstration plan	Information sheet	Well programmed
Job sheet	Lesson plan	gaming, case
Operation sheet	Assignment sheet	study, role
	case study material	play materials
	Programme learning material.	
	text- books.	

## PREPARATION AND USE OF DEMONSTRATION BY VOCATIONAL TEACHERS

-by D. THOMAS. SELLARAJ

### What is a Demonstration?

Demonstration is a method of teaching in which it is shown how a task requiring manual/physical skill or skills is performed or how an element of knowledge or information is applied in a practical work-situation alongside which explanations of what is being done and how it is done are generally furnished. In other words, it is a planned performance of an occupational/practical skill by a teacher/instructor or the application of information for the correct performance of a skilled job.

### Types of Demonstration

A demonstration may be as simple as showing one trainee or a group of trainees how to prepare one step in an operation such as fixing a switch on a round block or it may be showing how to perform a complex operation such as how to fix switches, 3 pin sockets and a fan regulator on a 20cm X 25 cm wooden box. Further the arm of demonstration is not limited to motor skills alone. An instructor may demonstrate how to read an instrument such as a micrometer and interpret its reading, how to fill out a form or a report, or what is the effect of a scientific principle such as magnetism and so on.

The two most highly used instruments of communication are the organs of sight and hearing. When an instructor demonstrates, he uses both these organs to the maximum. Of these two the sense of sight is the most effective instrument of communication and a demonstration uses this sense to the fullest. Often, the demonstration also appeals to one or more of the senses of touch, smell, taste and kinesthesia.

## Advantages of Demonstration

The demonstration method of teaching has several advantages. A demonstration is an effective device for learning through its attention catching properties. It provides strong motivation for learning by giving the learner something to watch and imitate. Further teaching through demonstration concretises learning by dealing with real and tangible objects.. It is easier to understand something after seeing its working rather than through attempts to visualize abstracts propositions. Last but not least, learning through demonstration is more effective and permanent than otherwise.

Preparation for effective and successful demonstration should be given in training programmes of a regular nature or a one shot-variety. As a part of this preparation, a trainee should develop a good command of language and technical terms. He should also learn to teach in a planned sequence.

A demonstration should be given when it fits in with teaching-learning activities, i.e., when it is needed. It should be accompanied by necessary knowledge and should be followed by application of the demonstrated technique to actual job performance or practice by those who have witnessed the demonstration.

Once the need of the demonstration is established, the next thing to do is to plan for the demonstration. One of the most difficult things for an instructor to realise is that the hundreds of skills he performs almost subconsciously must be carefully broken down, demonstrated and explained to the trainee. For this, a demonstration plan is most essential. Such a plan would require the teacher to list important steps, one after the other in an outline form, which development of these steps would require elaboration of necessary points. The steps along with key points are included in the demonstration plan for presentation to the students.



## Planning a Demonstration

A good demonstration is always planned one. Following tips for planning a demonstration should be heeded:-

1. Determine and clarify the purpose of demonstration. Give the students a clear picture of what to observe during the demonstration;
2. Include relevant information in the demonstration plan at the points where it is relevant;
3. Exclude irrelevant information or nice-to-know information.
4. Plan the demonstration for teaching one step of the skill at a time and proceeding from simple to complex.
5. Develop good motivating techniques to create immediate students' attention and interest.
6. Time the demonstration and keep it within the time limits. If it runs too long, break it down into two or more demonstrations.
7. A good demonstration must be rehearsed. Rehearse the manual skills and run through presentation mentally before actually giving a demonstration.
8. Anticipate and prepare for the difficult steps as disclosed by the rehearsal.
9. Obtain all the necessary materials, tools, equipments, instructional materials and training aids before the demonstration begins.
10. Arrange all the materials in advance, in the order in which they will be used.
11. Check all the equipments, tools and training aids to make certain that they are in working order.
12. Remove all unnecessary and distracting materials and equipment from the demonstration area.
13. Divide the class into convenient groups of students.
14. Stage the demonstration, under best conditions of lighting, watching and hearing and optimum availability of facilities such as electricity, gas, compressed air, water etc.

Hints for better Demonstrations

While giving the demonstration, the instructor should be relaxed and confident. His manner should be somewhat informal and friendly. He should try to build the trainee's confidence in his own ability to learn the skill being demonstrated. He should show enthusiasm, speak clearly and give an interesting and expert demonstration. He should be continuously alert for safety and should keep the trainee clear of moving parts, flying chips and other hazards. Sometimes, it is useful to go through a demonstration once at normal working speed so as to give the trainee over view of the skill. One can thereafter repeat it slowly step by step.

The following list provides suggestions for better demonstration.

1. Give a good performance, accompanied by necessary explanations, but do not be unnecessary theoretical.
2. Explain each step or process as the demonstration proceeds. Tell the "why" as well as "how".
3. Make certain that the trainee sees the demonstration from the angle at which he will be required to perform it.
4. Follow the demonstration plan meticulously, so that you can achieve its aims.
5. Make certain that all the trainees can see and hear.
6. Prepare key questions in advance and ask them as the demonstration proceeds.
7. Think of how the trainee thinks and feels as the demonstration proceeds.
8. Observe all safety rules and procedures.
9. Emphasize all the key points and relate them to the job.
10. Use instructional aids wherever they are effective and possible to use.
11. Use the chalk board for defining new names and words and for listing procedural steps.
12. Provide for trainee participation whenever possible.

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13. Demonstrate only the correct way of doing the skill. The trainee's first impressions should be the correct ones.
14. Make the demonstration a good example. Remember the role of imitation in learning.

Attached to this information you will find a demonstration format cum specimen for your guidance.

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NEW DEVELOPMENTS IN TECHNOLOGY

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Changes or new developments have been going on in every field. But now new developments are coming up with much faster rate than before. There are many areas in which new developments have taken place but here a few specific areas are mentioned.

1. Electronics
2. Generation and Transmission of Electrical Energy
3. Electrical Appliances
4. Industry
5. Agriculture.

ELECTRONICS:

Earlier, Radio was consisting of large number of electronic valves. The size of radio was large. Now the electronic valves have been replaced by a very small device i.e. Transistor. The size is very small. It is compact. Use of transistors have made the use of Radio possible even on a cycle and in the field. Similarly there have been developments in Television. From black and white T.V., we have now coloured T.V. with remote control. The latest development in T.V. is 3-dimensional T.V.

GENERATION AND TRANSMISSION OF ELECTRICAL ENERGY:

The most important development in generation of Electrical Energy is the development of Atomic Power Stations.

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To generate the same amount of Electrical Energy, only one Kg. of Uranium is required in an Atomic Power Station as compared to 36000 ton of coal required in a Steam Power Station. Similarly a single unit of Alternator has been developed upto 500 MVA as compared to less than 100 MVA previously. There has been continuous developments from 10 MVA to 200 MVA and now 500 MVA. Extensive efforts are going on to harness new sources of Energy i.e. wind, sun, etc.

In the field of Transmission of Electrical Energy, the earlier transmission voltage was 66 KV, Now 400 KV is coming up in India, Russia and other countries are using 500 KV since long.

#### ELECTRICAL APPLIANCES:

There have been many developments in Electrical Appliances which are used in houses. Now all kitchen operations are being done with one or other Electrical Appliance. To mention only a few, we have mixing machine (Mixi), Electric cooking range, washing machine, electric iron, toaster, electric heater, room heater, immersion heater, hot plate, electric kettle, etc. The new developments which took place in electric iron and mixing machine are as under:-

#### ELECTRIC IRON:

A selector switch was introduced

1. to iron different types of clothes, i.e. cotton, silken, polyester, woollen, etc.
2. The electric iron was made automatic by introducing Thermostat to automatically switch on or switch off the supply.

3. The latest development is filling up of water in the electric iron. The water is evaporated into wet steam which is sprinkled automatically on the cloth while ironing.

#### MIXING MACHINE:

Earlier mixing machine could do only two operations i.e., churning of liquids and grinding spices. Now there are number of attachments and almost all operations required in the kitchen including kneading of flour are possible.

#### INDUSTRY:

In Industry, automation is coming up very fast. This has resulted into production of materials in less time and of more good quality. New materials like plastics have been developed which has replaced wood and metals. Articles produced from plastics are cheap, durable and give better appearance.

#### AGRICULTURE:

After independence, there has been tremendous developments in the field of agriculture. Many new varieties of crops and vegetables have been developed. Apart from new varieties, the more important development is substantial increase in the yield per acre.

#### MOTIVATION FOR DEVELOPMENT:

In some persons, the desire to grow and progress is inherited from birth. In others it is acquired from environments. Famous scientists like Thomas Edison, James Watt, Wright Brothers belong to this category. Others have to be motivated and infused with a desire to develop new things as well as adapt to changes.

Change is accepted feature of life. There is a famous slogan "You cannot do tomorrow's job with today's skills".

Thomas Alva Edison, the great scientist says "I learn something new every day".

Vocational teacher has to take extra care that they actually keep on adjusting to new-developments in science and technology particularly in the field of their specialisation. They should keep the following in mind.

1. Develop the desire to improve: A good engineer or a scientist is always concerned about keeping abreast with modern developments. Modernisation can come only when there is a keen desire to modernise. The desire to improve is an ideal attitude to be developed in a Trainee. He should be made to feel that training programme is only the first step towards learning which is a going-on process in day-today work.

2. Application of knowledge in day-today work:

Merely getting knowledge is not sufficient. True knowledge will be gained only when one is able to apply the same in the practical field. The teacher should keep on applying new knowledge in day-today teaching.

2. Keeping up with New Modern Developments: There are five basic ways to keep acquainted with new developments.

(i) Reading New Books: Books are basic source of acquiring knowledge. Inculcating a habit of reading new books will help in acquiring new knowledge.

(ii) Reading Periodicals: such as journals, newspapers and magazines containing useful articles on modern developments in electrical appliances.



- (iii) Experts: who are continually working with new tools, methods and equipment.
- (iv) Experience is a great teacher: Experience frequently gives ideas for new and better ways of doing things. Experiments by skilled men have often led to useful and practical developments.
- (v) Special Training Programmes: Special programmes which are commonly known as refresher courses may be held where the participants are acquainted with modern techniques and developments.
- (vi) Creating New Products: There are many hurdles and financial difficulties to develop a new item. The Government of India has a department "National Productivity-Council" which gives financial assistance for new products. It also recommends names of individuals for award of prizes for new developments.

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## ELECTRICAL ACCIDENTS AND SAFETY

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Electricity is being used in every sphere of life. In fact there is no life without electricity. On one hand, electricity is very useful but on the other hand it is equally dangerous. An electrical accident may result into severe burns, paralysis of the body or total death. Electricity has also to observe certain rules and regulations. It should not be life threatening and formidable monster. To ensure public safety IE Rules 1956 are laid down. These rules are mandatory in terms of I.E. Act 1910. Besides I.E. Rules 1956, there are I.S.S. available, I.S.S. 732 (code and practice for electrical wiring and fittings in buildings) and I.S.S. 648 (Electrical layout in residential buildings).

### 1. ACCIDENT:

Accident is defined as an unplanned and uncontrolled event in which personal injury occurs to a person. There are certain theories in accident occurrence, which are given below:

1. A personal injury occurs as a result of an accident.
2. An accident occurs as a result of personal or mechanical hazard.
3. Personal and Mechanical hazards exist only because of some fault of person.
4. Faults of person are acquired from environment.

According to these theories, an injury possibly cannot occur unless there has been a personal unsafe act or exposure to unsafe mechanical condition.

## 2. CAUSES OF ACCIDENTS:

Exposure to hazard is much greater while carrying out maintenance jobs in electrical equipment than in any other industry. It becomes primary duty of the supervisor to see that acts of omission and negligence which lead to accidents are avoided.

The golden rule is "Always treat an electric apparatus as "Live" unless it is positively known to be "Dead". No one is immune to the accidents. Accident may happen due to:

1. Lack of supervision,
2. Lack of knowledge,
3. Overconfidence,
4. Negligence,
5. Improper tools,
6. Protective devices are either not used or are of greater capacity,
7. Lack of proper instructions,
8. Instructions not being observed properly,
9. Mental/physical condition of employee, and
10. Carelessness.

Indian Electricity Rules, 1956 are available which deal with the safety of employees from electricity.

Shock treatment charts are available which give clear instruction of taking necessary steps to detach a person from live wires and the necessary first-aid to be provided till the doctor arrives.

## 3. SAFETY PRECAUTION:

Safety measures for electrical equipment can be discussed under following headings.

1. Proper insulation,
2. Proper earthing,
3. Proper polarity of single pole switches and connecting fusewire,
4. Special precaution to avoid electrical fires,
5. Special precaution in bathrooms in wet places,
6. Special precaution with portable electrical appliances,
7. Limiting accessibility to electrical equipment,
8. Orientation of workman on the equipment.

Proper Insulation: Proper insulation of wires, accessories, equipment is very necessary. Lack of proper insulation may result into short-circuit which may lead to an electrical fire if the circuit is not protected properly. It may lead to leakage of electricity to the body of equipment. If the equipment is not properly earthed, it will result in an electric shock to the user. Before using an electric equipment, it is essential to test the insulation resistance by means of a device known as insulation megger. Insulation resistance between conductor to earth or between conductors in megohm should not be less than 50 (one No. of outlets

switch controlling one lamp will be taken as 2 outlets). If the wire is PVC, the value of 50 is reduced to 12.5. In no case Insulation resistance be less than one megohm and if it is less than 1 megohm, the apparatus should be taken out of service. Only use insulation tapes of good quality.

#### PROPER EARTHING:

Proper earthing of electrical equipment is very necessary for safety. If there is proper earthing, the leakage current will pass to the ground and completing its path will result into blowing of fuse. If the fuse wire

is of more capacity, the fuse will not blow and the body of electrical appliance will acquire certain potential above earth. If such a body is touched by a person, it will result into an electric shock.

1. 9 m A mild shock not painful,
2. 15 m A painful shock,
3. 15-25 m A initial shock and muscular control lost,
4. 50-100 m A may prove fatal.

High frequency currents are less dangerous due to skin effect.

The insulation resistance of body is  $5 \times 10^5$  Ohms, which may drop to 5000 Ohms, when wet. D.C. supply is more dangerous than A.C. In A.C. for 50 c/s, victim gets jerks 100 times per second. At zero position of the cycles, lucky person may get disengaged but in D.C. current flows continuously. The popular belief is that D.C. pulls victim to death whereas A.C. pulls and tries to throw away the victim. D.C. is more dangerous.

Whenever electric supply is given to an electrical appliance having metallic body, provision of earth wire through 3 pin plug is essential. The size of earth wire should not be less than half the size of the largest current carrying conductor. Earth wire for 3 pin socket is 14 SWG copper.

#### Proper Polarity of Switch and Connection of Fuse Wire:

The switch should always be connected in live wire and never in the neutral wire. Similarly the fuse wire should always be connected in live wire.

Special Precautions to avoid electrical fires:

## DO NOT

1. use incorrect size of fuses wire,
2. over load socket outlets,
3. store combustible material near switch board,
4. connect earth wire to gas pipe, and
5. make poor joints.

Precautions to use Electricity in Bathroom:

1. Locate switches outside bathroom,
2. use concealed conduct wiring,
3. do not use portable electrical appliances, and
4. properly earth the Gysar.

Special Precautions with portable electrical appliances:

1. Use insulated bush when wire passes through a hole in metallic body.
2. Do not handle electrical appliances with wet hands.
3. Insert dummy plug tops in socket outlets to avoid children inserting fingers.
4. Always switch off the supply before replacing a blown off fuse or replacing a lamp.
5. Do not disconnect a plug point by pulling flexible cord.
6. Use rubber slippers while handling electrical appliances.

Limiting Accessibility to electrical equipment:

Electrical equipment should be so installed that it is beyond the reach of unauthorised persons. Put proper indication signs and caution of the operating voltage in the local language.

Orientation of Workman on the equipment:

The workman should seat himself in a safe position in such a way that in the event of an accident, the workman falls away from the live wires.

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Role of the Vocational Teacher in Social Change

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Lecturer

Change is the law of nature and life. Changes in society are all the time taking place. Man may be conservative, but he is dynamic as well. He wants change. Changes are inevitable in life and society. In all spheres of life, things are changing. Sometimes these changes may be slow, in fact so slow that people do not even perceive them, and there are times when they are quite rapid and drastic.

Education is the product of social change, but at the same time, it is the creator of social change. In the words of Education Commission, "Education is expected to change the attitudes and values among people and create in them a desire for progress".

Social change denotes a new mode, modifying or replacing the old in the life of people or in the operation of society. Social change includes modification in social techniques, relationships, behaviour patterns, folkways, and institutions, sometimes leading to change in philosophic outlook.

The field of social change is very wide. It exhibits in many forms such as economic changes, political changes, religious changes, moral changes and scientific changes.

Many factors are responsible for social change such as physical environment, biological factors, technological and scientific factors, ideological factors and cultural factors.

Change in one element of society causes change in another. A change in economic conditions brings about change in the religious, political and social aspects of life.

### Cultural Lag

'Cultural lag' or 'Social lag' occurs when different aspects of the society fail to adjust themselves to changes already effected in some of its parts. Different rate of change is called cultural lag.

For example, changes in ideas beliefs and value systems will be slower than changes in material conditions. Scientific inventions are being increasingly used in various areas but the development of scientific attitudes characterised by objectivity and a desire for experimentation/<sup>is</sup> comparatively a slow process. Particularly, religious and social structures are not keeping pace with the changes in economic structure.

There are so many factors responsible for cultural lag such as conservatism, vested interests, different attitudes towards change, cultural inertia and fear, and cultural isolation.

### Role of the teacher in social change

In the words of Dr. Radhakrishnan, "Education is an agent/<sup>of</sup> social change. What in simpler societies was done by the family and the religious social and political institutions has to be done by educational institutions today". The teacher has the various functions to perform. The functions of the teacher are three-fold - Preservation of heritage, transmission of culture and dissemination of new knowledge/<sup>there by</sup> motivating dynamism and stimulating progress. . We are living in an age where there is constant explosion of new knowledge. If the rising generation is to be kept abreast with the advancing knowledge, the teacher first keep his knowledge up-to-date.



He must be creative and perceptive. He must have/dynamic and enthusiastic personality. The functions of <sup>the</sup> teacher in the sphere of social change are outlined below:

1. Keeping abreast with New Developments

Now a country's civilisations depend upon education. The rate of change in science and technology is very high and the teacher must remain watchful about these changes. He should keep himself in touch with new developments in his subject, not at least. He must keep his knowledge up-to-date; otherwise there is a fear of cultural lag.

2. Analysis of change:

The teacher invests the student with the capacity to use his intelligence, to distinguish between right and wrong and to follow certain ideals. The teacher determines the values which act as a criterion for the analysis of social change. Through this analysis and criticism, undesirable changes are prevented and desirable changes are accelerated.

3. Overcoming resistance to change:

Certain factors create resistance in the way of accepting social change. Teacher should help in overcoming resistance.

4. Assistance in adopting social change:

Whenever some social change occurs, it should be essentially adopted by teacher and he should assist people in adopting <sup>desirable</sup> changes.

5. Initiating change: The teacher should develop qualities for <sup>and</sup> initiating, guiding / participating movements for social reform. The teacher should help in arousing public opinion for the abolition of many social evils such as child marriage, dowry, widow remarriage, etc.

6. Providing leadership for social change:

Education in India must be able to create appropriate leadership, if social changes conducive to democracy are to be introduced. Teachers will have to take a lead in this direction. Teachers are the most respected and responsible persons in rural areas. They must adopt change and then provide proper leadership change.

7. Accelerating <sup>the</sup> process of modernisation:

With the fast increasing application of science and technology, the old and traditional thinking is being ideologically replaced by new norms with regard to ideology - political, social, economic and cultural and aspirations among the individuals, society and nations of the world. Modernisation which comes about as a result of change due to rational thinking goes hand in hand with development. Modernisation means a 'value change' significant institutional modifications and improvements (including standards of performance and achievement). It is not a mechanical imitation of some modernised country. It is not westernisation, a word which is often used in place of modernisation. Modernisation signifies the application <sup>of</sup> new knowledge to human affairs and behaviour. Among the most important attributes of modernity are high participation in national life, empathy, mobility, articulation of interests, rational ends-means calculation, new attitudes towards work, wealth, savings and risk-taking.

The teacher has a crucial role to play in developing the right outlook and attitudes necessary to transform the educational institutions into creative environments helpful to children in their development fulfilment. The teacher should not have a back mind. He must rise above

narrow ideas and ideas and caste creed and community .

The teacher is the living spark of learning in the child and open his heart and mind to the healthy winds of change.

### 8. Promoting National Integration:

Education for democracy, citizenship, patriotism and international understanding is intimately related with national integration. One of the important objectives of education is the achievement of social and national integration because it is the basis for political unity, religious tolerance, social and economic progress, development of national language and culture, and ultimately the basis for a strong and united country. In the words of Dr. Radhakrishnan "If India is to remain free, united and democratic education should train people for unity and not localism, for democracy and not dictatorship". The teacher is the key person in the process of social change. He will have to inculcate proper attitudes among students for accelerating the process of social change and national integration.

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## TESTING OF ELECTRICAL APPLIANCES

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The ultimate aim of vocational education in Electrical appliances is that at the end of the course when the student finally leaves the school, he should be able to

1. Locate faults in electrical appliances
2. Dismantle the electrical appliances
3. Repair or service the electrical appliances
4. Assemble the electrical appliances
5. And finally test the electrical appliance for its satisfactory working and against leakage.

To do the above jobs, a student should know the following.

1. All the electrician tools and their proper use.
2. All the materials required for repairs with their specifications and availability in the market.
3. All the instruments for testing and measuring.

The following instruments are needed for measuring and testing:

1. Ammeter
2. Voltmeter
3. Wattmeter
4. Neon tester
5. Insulation meggar
6. Multimeter
7. Series test lamp and
8. Series test Board

Procedure: When an electrical appliance is received for repairs, the following systematic procedure should be applied.

1. The first step is to locate the fault. The following types of faults may occur.

- (a) open circuit in the element.
- (b) short circuit of the element
- (c) leakage of current in the body of the appliance
- (d) connecting leads are broken
- (e) short circuit in the connecting leads

Any one of the testing equipment mentioned above could be used for locating the fault. A repair shop electrician normally uses either series test lamp or series testing board or sometimes neon tester is also used.

The procedure applied for fault location should be scientific and not at random. It is not that as soon as the electric appliance is received for repairs, say an electric iron, the electrician starts testing the electric iron. It is just possible that the defect is in the connecting leads. He should, therefore, first test the connecting leads. In connecting leads, also, the first step is to see whether the leads are connected to the terminals of the plug and the connector. After checking the terminals, check for open circuit or short circuit in the leads. If the connecting leads are found satisfactory, then test the electric iron.

2. Dismantling the appliance: After having located the fault, if the electric iron needs dismantling, it should be dismantled using proper tools and taking care that no healthy part is damaged during dismantling.

3. Assembling the appliance: After replacing or repairing the appliance, the appliance should be assembled properly using all washers and nuts.

4. Testing the appliance: After assembling the appliance, the electrical appliance should be tested specially against leakage. This should be done with insulation megohm. The value of insulation resistance should not be less than one megohm.

## PUPIL EVALUATION IN VOCATIONAL COURSES

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Evaluation of both the teachers and the students is a necessary part of the educational process. Evaluation of student is necessary to achieve certain preset goals, objectives and standards and also for continuous growth. The evaluation has also to be continuous as the student needs to be evaluated in every sphere of life (i) Academic Learning; (ii) Development of Vocational skills and abilities; and (iii) Desirable attitudes, habits and adjustments. For academic learning and practical skills, the student is evaluated in class room and in a Laboratory or workshop. There are many social activities in the schools for development of students including character. Such activities are (i) Sports, (ii) cultural activities, (iii) Debating, and (iv) Publishing school magazine, etc.

The modern concept of evaluation emphasizes the responsibility of the teacher not only for imparting information but also for the development of understanding skills, attitudes, and habits. Evaluation is estimation of the growth and progress of student in respect of fulfilment of the objectives of a particular curriculum.

The functions of evaluation are as under:

1. To collect evidence to ascertain the degree to which the students are progressing.
2. To permit teachers to evaluate the effectiveness of curricular experiences activities and instructional methods.

3. To make provisions for guiding the growth of individual students.
4. To diagnose weaknesses of the students.
5. To point out areas where remedial measures can be taken.
6. To provide a basis for modification of the curriculum.
7. To introduce new experiences to meet the needs of individual students and their groups.
8. To change the strategies and methods of teaching for a particular group of students.

#### Principles and Procedures of Evaluation:

1. To determine what we wish to evaluate. Teachers and administrators must first define the objectives towards which the student's growth and development is to be guided.
2. To define what we wish to evaluate in terms of measurable behaviour. It is not sufficient to make a list of objectives. The objectives must be clearly defined. For example, it is necessary to outline specifically the skills and knowledge in theory or practical work in the Laboratory.
3. Selecting appropriate situations: in which to observe performance. The appropriate situations may be classroom, Laboratory or workshop. There may be types of test items and jobs that would elicit the behaviour in which we are interested. Observation samples should be sufficiently large and exhaustive so that information based on students' performance would give fairly accurate indications of students' usual level of performance with regard to existing tests.



of tests:  
4. Selection/available/ The next step is to find out the position with regard to existing tests and instruments and make selection of it if possible. Preparation of required tests may be undertaken, if necessary. Techniques for measuring performance in appropriate situations may be determined before undertaking of test development of students. We also ascertain whether there is any possibility of application of available standardised and published tests and scales for measuring performance in a particular situation. For many situations it would be essential to construct necessary techniques by constituting a committee of experts.

5. Getting Record: Written tests provide records of student's performance for scoring or evaluation. In testing manual and communication skills the performance can be recorded on audiotapes for more reliable and objective assessment. For evaluation of personal characteristics of students, teacher's observation could be recorded in a narrative form.

6. Summarising the evidence: The application and interpretation of the results will help teachers and administrators to guide the growth and development of each student to the best of his individual capacity<sup>and</sup> ability. It will also help to judge the effectiveness of curriculum and instructional techniques that are being used and to make desirable modifications in them.

Evaluation of teacher: The student's performance largely depends on teacher's method of teaching. Some teachers are rated good and others may be very good. A teacher who takes himself to the master of subject is probably mistaken. A teacher automatically evaluates himself on the basis of results of the examination of his class.

### INTERNAL ASSESSMENT:

Apart from other basic foundation courses, the subjects which relate to vocational education in electric appliances are

1. Vocational theory I, II, III, IV, V and VI.
2. Vocational Practical I, II, III, IV, V, and VI. The examination marks which are allotted both for vocational theory and Vocational Practical <sup>are</sup> 100. In addition to the examination marks, the following sessional marks have also been allotted for Vocational Practicals.

1. Vocational Practicals I, III, IV and VI - 25 marks
2. Vocational Practicals II and V - 50 marks (Vocational Practical II and V are the core of the Vocational Practicals. The weightage allowed for vocational theory is 10% and for Vocational Practical, it is 12.5% in I, III, IV and VI and 15% in II and V. .

The scheme has provided sessional marks for Vocational Practicals but there are no sessional marks in Vocational theory. It will be advantageous to the student if some sessional marks say 25 are also provided for vocational theory. This will make the student to study regularly and not at the end of the year. On the basis of sessional marks, examinations at regular intervals may be held depending upon semester or annual system. The salient points of internal assessment are:

1. To watch his (student's) progress throughout the year.
2. To make him study regularly and not at the end of the year. .
3. Helps the teacher to evaluate himself.
4. Helps the parents to watch the progress of the student

through progress reports.

5. Helps the School Administration to know the standard of the student and make improvements before the final examination.

Personality Traits: A student should also be assessed for personality traits on the following points:

Initiative, accuracy, sincerity, co-operation, attitude, promptness, awareness, tactfulness, readiness, willingness, alertness, patience, reasoning power, calmness, good conduct, carefulness and quick response.

Criteria for Vocational skills: A student of Vocational Course in Electrical Appliances, should acquire the following skills:

1. Speed
2. Accuracy
3. Quality i.e. workmanship
4. Productivity (i.e. quantity)

The ultimate aim is that the student should have competency in above skills upto the required standard.

#### EXTERNAL EVALUATION:

External evaluation is done by holding annual examinations by the Board of Education. The whole year work of the student will be evaluated through declaration of examination results. Schools whose results are very good have taken sufficient care for evaluation and internal assessment. If the results are poor, apart from applying continuous evaluation and internal assessment, the examination reports submitted by external examiners should be carefully analysed by the concerned teacher.

SPECIMEN LESSON PLAN

S'r. Sankaraj &  
Dr. T.P. Lulla.

Name of Teacher:

Class:

Name of School:

Period:

Date:  
(2-3 periods)

Subject: Domestic Electric Appliances.

Topic: Electric Iron and its construction and functioning.

I. Instructional Objectives:

1. Students will know the different parts of electric iron.
2. Students will understand the uses of electric iron.
3. Students will know different types of electric irons.

II. (a) Methods: Lecture and Discussion

(b) Media (AIDS): Chart

(c) Materials: Electric Iron

(d) Equipment & Tools: Combination Pliers (200mm- 1No.)  
Screw driver (200mm. 1 No.)

III. Introduction: The teacher will introduce the topic by asking following questions;

1. Why do we get our clothes pressed?
2. Do you know how many types of irons are there?
3. Which iron is commonly used in houses now-a-days?

IV. Statement of the Aim- Today we are going to learn about 'Electric Iron - its Construction and Functions'.

## V. Presentation:

Techn. points	Specific objectives in behavioural terms	Teachers' activity	Pupil's activity	Evaluation
1. Working of electric iron. It is an instrument when heated helps in pressing clothes.	1. Pupils will define the electric iron	Teacher explains as to what is an Electric Iron (Showing Iron or Drawing)	Pupils listen and observe if Iron is showed or draws a diagram if drawn on blackboard.	1. How many of you have electric iron in your home?
2. Construction and functioning of its different parts. -Sole plate -Heating element -Pressure Plate -Cover plate -Handle -Power cord	2. Pupils will identify different parts of an electric iron. 3. Pupils will state the functioning of the different parts of an electric iron. 4. Pupils will draw diagrams.	Teacher will explain the different parts of the Iron by drawing the isometric view or with the help of chart	Pupils understand the different parts of an electric iron. -Pupils observe the diagram. -Pupils draw the diagram. -Pupils take down BB notes.	2. What are different parts of an electric iron? 3. Why is heating element important? 4. What type of handle should be used and why?
3. Principle of working-Heating effect of electric current.	5. Pupils will state principles	Teacher explains about the heating effect of electric current, telling them- Nichrome wire- 1. High specific resistance. 2. Non-oxidising property 3. High Temperature	Pupils understand the principle and use of nichrome wire, due to resistance high temperature is produced.	5. What happens when electric current passes through a resistance?

Teaching points	Specific objectives in behavioural terms	Teacher's Activity	Pupils' Activity	Evaluation
<ul style="list-style-type: none"> <li>Types of Electric Iron.</li> <li>Steam Iron</li> <li>Ordinary automatic</li> </ul>	<ul style="list-style-type: none"> <li>6. Pupils will differentiate/classify between different types of Irons.</li> <li>7. Pupils will reason out the differences in various types of irons.</li> </ul>	<p>Teacher with the help of different models/charts explains the different types of iron and explains differences in various types and draw a flow chart.</p> <p>Teacher with help of diagram explains the mechanism of thermostat and setting of different temperatures that is Speciality of this Iron.</p> <p>Teacher explains them about Radio interference and Suppressor Capacitor. Teacher explains the importance of indicator bulb.</p>	<p>Pupils listen, understand, differences and learn the new terms. Pupils observe the models of electric irons. chart and mark the differences in various types and draw diagram.</p> <p>Pupils draw the diagram and understand the mechanism of thermostat. Pupils learn the different settings of temperature and understand why different temperatures are required for different types of cloths e.g. cotton and synthetics and woolen.</p>	<p>6. Explain the differences between various types of electric irons.</p> <p>7. Why is light moisture acquired in the cloth while ironing?</p> <p>8. Why is necessary to have different settings of temperature?</p> <p>9. Explain how the capacitor stores energy released by the spark and quenches the arc.</p> <p>10. Explain the use of indicator lamp.</p>
<ul style="list-style-type: none"> <li>Parts of Steam Iron</li> <li>Adjustment water tank</li> <li>Valve</li> <li>Push button</li> <li>Nozzle</li> </ul>	<ul style="list-style-type: none"> <li>9. Pupils describe different parts of Steam Iron.</li> </ul>	<p>Teacher with the help of model/chart explains different parts of Steam Iron.</p> <p>Teacher compares the automatic Iron and Steam Iron.</p>	<p>Pupils learn different parts of the Steam Iron</p> <p>Pupils observe model/chart.</p> <p>Pupils draw a diagram.</p> <p>Pupils describe the differences between the automatic Iron and Steam Iron.</p> <p>Pupils understand the different functioning of both the types of Irons.</p>	<p>11. How is Steam Iron different from automatic Iron?</p>

Teaching points	Specific objectives in behavioural terms	Teacher's Activity	Pupils' Activity	Evaluation
7. Fault findings various defects. -Failing of heating element. -Pilot lamp does not work -Heed is too high or low. -Iron gives shock -Chattering of the contacts.	10. Pupils will discriminate various defects.	Teacher teaches them different techniques/ devices to find out fault in an electric i.r.n.	Pupils learn and use different methods of finding out faults.	12. How will you find out faults in an electric i.r.n.

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VI. Recapitulation/Revision: The teacher will revise the points in the following way-

A. Theoretical Questions-

1. State the principle of an electric iron.
2. Explain the types of electric iron.
3. Explain with neat and labelled diagram how an automatic iron works?
4. State the temperature required for various types of clothes.
5. What is Steam Iron?
6. What are the causes of Shock in an electric iron?
7. How will you find out faults from an electric iron?

B. Application: Explain-

1. Joules law
2. Identify parts
3. Bending of Bimetal
4. Symbol of capacitor and its construction
5. Conversion of Fahrenheit to Centigrade.

C. Practical work-

1. Put new element in an ordinary iron.
2. Adjust temperature mechanism in an automatic iron.

VII. Black Board Summary

Date:

Class:

Domestic Electric Appliances

Period:

Electric Iron - its Construction and functioning

1. Electric Iron - It is an instrument when heated helps in pressing clothes.
2. Construction and Functioning of its different parts-
  - (a) Sole plate
  - (b) Heating element
  - (c) -----
  - (d) -----
  - (e) ----- and so on

3. Principle of working-



4. Types of Electric Iron

4.a. Parts of Automatic Iron--(Details)

4.b. Parts of Steam Iron (Details)

5. Fault findings - (Details)

DIAGRAM OF/ELECTRIC IRON

Specimen Demonstration plan (for Electric Irons)

- Sri Phani Sridhar

Name of the Trainee: \_\_\_\_\_ Date: \_\_\_\_\_  
Name of the school: \_\_\_\_\_ Class: \_\_\_\_\_  
Subject: Domestic Electrical Appliances  
Topic: Repair of an Electric Iron

I Specific objectives: The trainee will be able to

- 1) visually inspect an electric iron and find the fault
- 2) test the iron with insulation megger for continuity and insulation.
- 3) dismantle the iron
- 4) replace heating element
- 5) assemble the iron

II a) Methods - Demonstration

• b) Media (AIDS) - chart

- c) Materials - 1) Heating element for iron 750w, 230v - 1No.  
2) Candle - 1 No.  
3) Match box - 1 No.

- d) Equipment & Tools : 1) Insulation meggar 500v - 1No.  
2) Combination pliers 200mm-1No.  
3) Screw driver 150mm- 1No  
4) Adjustable spanner 3/8 inch - 1No.

III Introduction:- The teacher will discuss the use of electric Iron in modern houses. Teacher will emphasise on the charges prevalent in the market when something goes wrong with it. And teacher will point out the need of learning to correct faults and enlighten them on the possibilities of earning by repairing iron.

Presentation: Following steps will be followed by the trainee during demonstration.

# PRESERVATION:

## Operations

## Procedural steps

## Information points

1. Visually inspect the iron for defects

Check the surface of iron for dents and breakages.  
Check the power cord for kinks and damaged insulation.

A fall can cause dent or breakage.  
Connecting cord may get damaged due to heat or long usage.

2. Test the continuity of the heating element

Connect the megger to the irons three pin plugs phase and neutral. Rotate the megger.

check whether the megger is ok.

If there is no continuity check power cord.

Open the terminal cover. Disconnect the wires of power cord from terminal block

There should be continuity if the element and power cord are ok.

Ask trainees to make a note of cord colour code and connecting terminals.

Show <sup>how</sup> the power cord continuity can be checked. If power cord is ok and there is no continuity

Thermal relay knob must be kept at various positions during the test.

In the element, then it shows

there is a break in the element.

Refer the result in Table-1

Table-1

3. Test the

assuming the element is burnt/open proceeds below

Before  
Dismantling

Condition	Continuity	Insulation Test
-----------	------------	-----------------

After  
Assembling

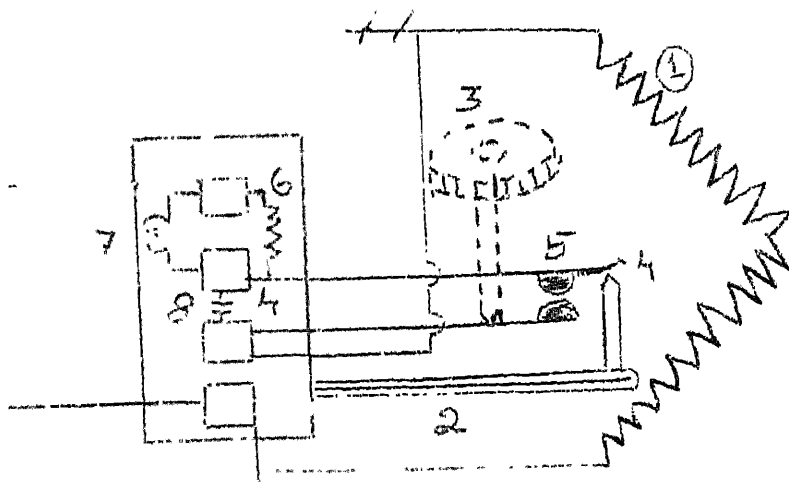
Operations	Procedural Steps	Information Points
3. Test the insulation of the iron	Connect the megger/between earth/body of the iron to alternatively to phase and neutral of the plug. Enter the results in Table-1.	Insulation resistance should be in the order of 2 megohm or more. Less value indicates poor insulation.
4. Dismantle the iron	Remove the body biting nuts & remove the cover. Remove the pressure plate nuts and the connections. Remove the heater element without damaging the asbestos sheet. Clean the surface area of the sole and pressure plate.	Draw the connection diagram of the terminal block Inspect the asbestos and mica insulations and heater element.
5. Assemble the iron	Check the heater element with megger. Keep the mica on the sole plate in position. Keep the element over the mica. Then place the mica sheet over the element. Place the asbestos sheet over the mica. Fix the pressure plate, Thermostat and connections fix the cover.	Usual check on the element is essential. Tell the students that normally thermostat requires no adjustment. Show them how to adjust the relay if necessary.
6. Test the iron for continuity & insulation	Repeat the procedure. Enter the results in Table-1. When test result is ok. Fix the power cord and the terminal cover.	After fixing the power cord connections a check for continuity and insulation will be better.

Application: Ask the trainees while the demonstration is in progress,

- 1) to identify the parts
- 2) to make terminal connections
- 3) to observe relay operation
- 4) to make provision for insulation & element/strip contact continuity.

Each group to be observed, if necessary

Placed in turn and at intervals to individually to dismantle and reassemble the automatic iron with in a period of 45 mts.



- |  |  |
|--|--|
| 1. Heating element                     | 5. Contact Points                            |
| 2. Bimetallic Strip                    | 6. Series Resistance for the indicator bulb. |
| 3. Adjusting Knob (Thermal Relay Knob) | 7. Indicating Bulb                           |
| 4. Contact Strip                       | 8. Radio interference suppressor Capacitor   |

## APPENDIX A

### Course Content

#### I. Vocationalization of Education

1. Vocationalization of education - its concept and meaning, significance, objectives and essential features.
2. Vocationalization of education in India - its progress, problems and future.
3. Vocationalization of education in Andhra Pradesh, Tamil Nadu and Karnataka with special reference to Repair and Maintenance of Electrical Appliances.
4. aims and objectives of vocational education.

#### II. Education

1. Education - its definition and meaning. Aims and objectives of education. Education, instruction and training.
2. Aims and objectives of education at different stages of school education. Aims and objectives of higher secondary education in general and vocationalised higher secondary education, in particular.
3. Basic values of the Indian society and their implications for education.
4. Agencies of Education and their role in Vocational Education.
5. Education and social change. Role of the vocational teacher in social change.
6. Role and responsibilities of vocational teachers.
7. Communication skills.

#### III. Educational Psychology:

1. Learning - its nature and process. Learning by trial and error, conditioning and insight.
2. Types of learning - cognitive, affective and psychomotor. Learning of manipulative skills.
3. Factors affecting learning. Motivation and learning.

4. Adolescent principles of learning and their application in teaching.
5. Adolescent's meaning and importance.  
Characteristics of adolescents. Typical problems of adolescents and ways to tackle them.
6. Mental ability, interests and aptitudes and their significance for vocational guidance.

#### IV. (A) Pedagogy in General:

1. The concept and characteristics of good teaching.
2. Skill-based teaching.
3. The teaching skills of stimulus variation, reinforcement, questioning, explanation, demonstration and illustration.
4. Integration of teaching skills.
5. Classroom interaction techniques.
6. Models of teaching.

#### (B) Pedagogy of Teaching the Vocational Course in "Repair and Maintenance of Electrical Appliances".

1. Aims and objectives of teaching the course.
2. The structure of curricula in vocational courses, competency-based curriculum. Job analysis.
3. Methods of teaching the vocational course in Repair and maintenance of Electrical Appliances: understanding of basic principles, observation of the working models, demonstration of work, practical work by students and on-the-job training.
4. Lesson planning.
5. Evaluation of vocational courses of a practical nature-principles and procedures; internal assessment and external evaluation.
6. Evaluation of practical work - process and product evaluation - criteria and techniques.
7. Electrical Accidents and Safety measures.
8. Problems and difficulties in teaching the vocational course in the Repair and Maintenance of Electrical Appliances. Problems confronting teachers of this course in the three States.

9. New developments in the field of technology.
10. (a) Cost estimating
- (b) Drawing and designing
- (c) Project Development
- (d) Testing of Appliances and instruments.

Practical Work:

1. Analysis of classroom teaching behaviour
2. Preparation of a lesson plan/teaching-learning unit.
3. Preparation of evaluation material.
4. Servicing/maintenance of electrical appliances.
5. Preparation of prototype model of an electrical appliance or a part thereof.
6. Preparation of project-plan.

Visits to:

1. Industries/business enterprises connected with production/ sale of electrical materials/appliances.
2. Electric power stations/installations.
3. Workshops.



# APPENDIX F

## DAY-TO-DAY PROGRAMME OF THE TRAINING COURSE (May 15 - June 4, 1986)

Date	May 15, 1986		May 16, 1986		May 17, 1986		May 18, 1986		May 19, 1986	
	Time	Activity	Time	Activity	Time	Activity	Time	Activity	Time	Activity
15th	9.30 to 10.40	Registration of Participants	11.00 to 12.00	Inauguration of the course by Sri S.G. Patil, Director Voc. Education, Karnataka	12.00 to 1.00	(Prof. Mrs. S.P. Patel) Meeting the participants, introducing the course in greater detail.	2.15 to 3.15	(Sri. Sellaraj) Aims & objectives of Teaching the Voc. course in Repair & Maintenance of Electrical Appliances.	3.30 to 4.30	(Prof. S.P. Patel) Vocationalization of education in India, progress in the three participating states.
16th		(Prof. Patel) Voc. Education-its definition & meaning, different forms of Voc. education		(Dr. Yadav) Education-its concept, process & outcomes		(Mr. Rao) Education/ Psychology, its need and importance for teachers.		(Mr. Rao) Adolescence-its meaning & importance, characteristics of adolescents		(Mr. Sellaraj) Structure of the course in the three states, strengths & weaknesses
17th		(Prof. Patel) Vocationalization-its need & importance, objectives of Voc. Education.		(Mr. Rao) Characteristics & Problems of Adolescence		(Mr. Rao) Problems of Adolescence, ways to tackle them.		(Dr. Yadav) Education, instruction and training, importance of Voc. Education.		(Mr. Sellaraj) Competency-based curriculum, job
18th		9.30 to 10.30 (Mr. Rao) Vocationalization-its need & importance, objectives of Voc. Education.		10.00 to 11.00 (Mr. Rao) Factors affecting learning		11.00 to 12.00 (Mr. Yadav) General Aims and objectives of Education		12.00 to 1.00 (Mr. Sellaraj) Mechanics of Preparing competency based curriculum, skills		

1	2	3	4	5	6
19th	(Prof. Patel) Voc. of Education in India - historical background, position, Voc. of education & K.E.P	(Mr. Rao) Motivation and learning	(Mr. Rao) Theories of learning	(Mr. Sellaraj & PGTs) Selection of group projects	(Mr. Sellaraj & PGTs) Cost-estimating
20th	(Prof. Patel) Aims & objectives of education at different stages	(Dr. Yadav) Aims & objectives of education according to K.E.P.	(Prof. Patel) Organizational structure of Voc. education, agencies involved in it with particular reference to the three states	(Mr. Sellaraj) Designing the projects	(Mr. Sellaraj & PGTs) Practical work in the projects.
21th	(Dr. Yadav) Agencies of Education	(Prof. Patel) Basic values of the Indian Society & their implications for teaching	(Dr. Yadav) Education & social change, role of the vocational teacher in social change	(Mr. Sellaraj) Methods of Teaching the course	(Mr. Sellaraj & PGTs) Practical work on methods
22th	(Dr. Yadav) Role and responsibilities of the vocational teacher	(Mr. Rao) Accepted principles of learning and their application in teaching	(Mr. Rao) Individual differences in Mental ability, aptitudes in artists	(Mr. Sellaraj) Lesson planning	(Mr. Sellaraj & PGTs) Practical work on lesson planning
23rd	LOCAL TRIP				

1	2	3	4	5	6
21th	(Prof. Patel) Basic values of the Indian society & their implications for teaching	(Dr. Yadvav) Models of teaching	(Mr. Sellaraj) New Development in the field	(Dr. Lulla) The concept & Characteristics of good teaching	(Mr. Sellaraj) (Mr. Singhal & PGTs) Practical work
25th	8.30 to 9.40 (Mr. Rao) Measurement of Indi- vidual Differences	9.40 to 10.40 (Mr. Rao) Communication Skills.	11.00 to 12.00 (Dr. Yadvav) Models of teach- ing	12.30 to 1.00 (Dr. Lulla) Skill-based teach- ing, different types of teaching skills	(Mr. Sellaraj, Mr. Singhal & PGTs) Practical work
26th	(Dr. Lulla) Different types of teaching-skills- their demonstration	(Mr. Rao) Communication skills	(Mr. Rao) Communication skills	Models of teaching with special refer- ence to Voc. Education	(Mr. Sellaraj, Mr. Singhal & PGTs) Practical work
27th	(Prof. Patel & Dr. Rao) Main features of the new educational policy	(Dr. Lulla) Skill of Expla- nation	(Dr. Lulla) Practical work on the skill of expla- nation	(Singhal) Classroom Management	(Singhal & PGTs) Practical work
28th	Guest Lecture	(Dr. Lulla) Skill of questioning	(Dr. Lulla) Practical work on the skill of questioning	(Singhal) Evaluation of student learning- principles & pro- cedures, internal & external evalua- tion	(Singhal & PGTs) Practical work on evaluation.
29th	Guest Lecture	(Dr. Lulla) Practical work on the skill of illustration & demonstration	(Mr. Lulla) Skills of illus- tration & demon- stration	(Singhal) Evaluation of prac- tical work, process & product evaluation	(Singhal & PGTs) Practical work on evaluation of V.C. skills.

1	2	3	4	5	6
30th	LOCAL VISITS				
31st	Guest Lecture IV	(Dr. Lulla) Practical work on the skills	(Dr. Lulla) Skills of stimulus variation & reintro- duction	(Singhal) Testing of Instru- ments & appliances	(Singhal & PGTs) Practical work
1st	9.30 to 9.40 (Dr. Lulla) Integration of Teaching skills	9.40 to 10.40 (Dr. Lulla) Practical work on integration of teaching skills	11.00 to 12.00 Guest lecture V	12.00 to 1.00 (Mr. Singhal & PGTs) Practical work	
2nd	(Dr. Lulla) Lesson Planning	(Dr. Lulla & Singhal) Lesson planning	(All R.P.S.) Personal & Profe- ssional problems & difficulties of teachers of this course	IV and V Period-LOCAL VISIT	
3rd	(Dr. Lulla) Classroom Inter- action analysis	(Dr. Lulla) Classroom inter- action	Guest Lecture VI	(All R.P.S.) Guest Lecture by participants & discussion.	(Singhal & PGTs) Finalisation of practical work
4th	(All R.P.S.) Finalisation of recommendations on problems and difficulties of vocational teachers		Valedictory function	Disbursement of TA/DA	

APPENDIX CQUESTIONNAIRE FOR EVALUATION OF THE PROGRAMMEIdentifying data:-

1. Name of the teacher-trained:

2. Institution in which working:

3.A.School/College Address:

B. Home Address.

Questionnaire:

To what extent were the following objectives of the course achieved? Put a tick mark (X) in the appropriate column.

S1. No.	Objectives	Fully achieved to a large/small extent.	Not achieved
1.	To develop an understanding about the philosophy and programme of vocationalisation in the country.		
2.	To develop an understanding of the objectives of school education, and role of the school in achieving them.		
3.	To help them perceive their role as guides and agents of social change.		
4.	To develop in them understanding of the bio-psycho-social needs, and problems of the adolescents.		
5.	To help them understand specific objectives of vocational courses in electrical appliances.		

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Sl. No.	Objectives	Full Achievement			Not achieved
		Extent	Extent	Extent	

6. To help them develop skills for teaching in general.
7. To help them develop competence to teach the vocational subjects of their specialisation on the basis of accepted principles of psychology and teaching.
8. To help them develop skills for practical work in the course.

2. What in your opinion were the major strengths and weakness of the course from the academic, administrative and organisational points of view?

(a) Academic

Weaknesses

Strengths

(b) Administrative and organisational

Strengths

Weaknesses.

3. To what extent did you benefit from the course?

Sl. No.	Areas	Very Much				Some what	Not at all
		much					
1.	Vocationalisation of education						
2.	Educational Psychology						
3.	Teacher and Education in the Indian Society.						
4.	Teaching skills and competencies						
5.	Teaching of the electrical appliances course.						
6.	Practical/Project work in the workshop.						

4. a) Mark the extent to which practical work was beneficial to you?

Very much	Much	Some What	Not at all
--------------	------	--------------	---------------

1. General Teaching skills.
2. Teaching of Electrical Appliances course.

- b)
- |              |      |              |               |
|--------------|------|--------------|---------------|
| Very<br>much | Much | Some<br>what | Not at<br>all |
|--------------|------|--------------|---------------|
- How beneficial were your field trips?

- c)
- |              |      |              |               |
|--------------|------|--------------|---------------|
| Very<br>much | Much | Some<br>what | Not at<br>all |
|--------------|------|--------------|---------------|
- How beneficial were your guest lectures?

5. What is your opinion about the three-week duration of this course with 5 hours lectures/discussions/practical work every day?

(a) The course was

1. adequate in duration.
2. shorter than needed.
3. longer than needed.

(b) With the same course content, the course should be of

1. three weeks' duration as at present.
2. one month's duration.
3. one and a half month's duration.
4. 15 days' duration.

6. What is your overall opinion about the course?

Excellent    Very good    Good    So-so    Not satisfactory





# APPENDIX D

List of participants in the Training Course in Pedagogy held at RCE, from May 15th to June 4, 1986

Sl. No.	Name of the participant	School/College Address	Home Address	Educational Qualification	Total teaching Experience	Teaching Experience in this Institution
1.	V. Chenga Reddy	P.C.R.Govt. Jr. College, Chittoor-517001.	4-89 Ramanagar Colony, Chittoor-517002.	L.E.E. B.Tech III Year (CCC) (Studying B.Tech in J.N.T. University, Hyderabad, in course of Correspondence and Contacting course)	24 Years	5 Years
2.	D. Mohana Rao	Vocational Dept. S.R.R. & C.V.R. Govt. College, Vijayawada, Krishna (Dt), Andhra Pradesh.	Opp.to Sunna Battl, Santhi Nagar, Gunadala, Vijayawada-5, Andhra Pradesh.	L.E.E.	23 Years	5 Years
3.	C. Janakiram Naidu	P.C.R. College, Chittoor, Andhra Pradesh.	Employment Office street, Chittoor, A.P. 517001.	M.A., L.E.E.	20 Years	5 Years
4.	V. Satyanarayana Setty.	Engg. Instructor, P.S.C. & K.V.S.C. Govt. College, Nandyal, Kurnool District, Andhra Pradesh.	9/138, Ramalaya Street, Nandikotkur, Kurnool Dist., Andhra Pradesh.	L.E.E.	26 Years	5 Years

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	C. Narasimha Reddy	Engineering Instructor, S.C.N.R.Govt. College, PRODDATUR, Cuddapah (DT) Andhra Pradesh.	Co-Op. Colony, 3/297-J-3, Aravindasramam Road, PRODDATUR, Cuddapah (DT) Andhra Pradesh.	L.E.E.	20 Years	5 Years
6.	M. Sambasiva Rao	Engineering Instructor, Dr.V.S. Krishna, Govt. College, Vishakapatnam-13, Andhra Pradesh.	Munagapaka Anakappalli Taluk, Vishaka- patnam District, Andhra Pradesh, PIN 531 033.	L.E.E.	22 Years	5 Years
7.	D. Sambasiva Rao	Govt. Junior College, Samalkot-533 440, East Godavari, Andhra Pradesh.	H.No.16-1-36, Matam Centre, Samalkot-533440, East Godavari, Andhra Pradesh.	L.E.E.	16 Years	4 Years
8.	W.Jagannadha Rao	Dr.V.S.K.Govt.College, Vishakapatnam, Andhra Pradesh.	D.No.54-9-30, Isukethota, Visakhapatnam-10, Andhra Pradesh.	L.E.E.	19 Years	4 1/2 years
9.	I.V. Ramana	S.C.I.M.Govt. College, Tanuku, West Godavary Dist., Andhra Pradesh.	I.V. Ramanna, D.No. 27-60, Hanumanta Rao Peta, Tanuku, West Godavari Dist., Andhra Pradesh.	L.E.E.	25 Years 21 years in years in Z.P. High Vijayawada. School, TANUKU S.R.R. & as Enge. C.V.R. Govt. Instructor. College. 1 1/2 years in S.C.I.M. Govt. College, TANUKU.	In college 3

(2)	(2)	(3)	(4)	(5)	(6)	(7)
10.	Veeranajouca V. Mallur	M.A.S.C. College and J O D C, Haunsbhavi-581109, Hirekerur, (TQ) Dharwad, (Dist) Karnataka.	Main Road, Haunsbhavi-581109, Hirekerur, Dharwad, Karnataka.	D.E.E.	2 Years in Practicals in Industry. 5 years in teaching. 17 years totally.	Five Years
11.	V.V. Belvi	G.S.S. College, Belgaum.	3553-B, Risaddar Street, Belgaum.	D.E.E.	15 Years (In field + teaching)	7 Years
12.	Bhimashankar	Bhimashankaran.N., Lecturer, Electrical Wiring & seer of electrical Appliances, Govt. Science College, Station Road, GULBARGA.	B.N. Jewarjekar, H.No.2.337, Near Hanuman Temple Jagat, GULBARGA-585 105.	D.E.E.	5 Years	3 Years in the present Institution Other two years in industry.
13.	Prabhakar Dev Rao Patil	Vidyaranya Composite Junior College, Dharwad, Karnataka.	Prabhakar D. Patil, Jhansi Laxmi Road, ALNAV.R-581 103.	D.E.E. M...	16 Years	8 Years
14.	Mallikarjun	M.D. Kadade, Lecturer, S.S. Khubda, Basaveswar College, Basavakalyan, BIDAR-585 327.	Mallikarjun, S/o. Dulayya Kadade, Near Basaveswar Temple, Basavakalyan, BIDAR.	D.E.E.	6 Years	6 Years

(1)	(2)	(3)	(4)	(5)	(6)	(7)
15.	BAMESH G.C.	Barathi College, Bharathi Nagar, (K.M.DODDI), Mandya District, KARNATAKA.	Ramesh, G.C., Gejjalagere, Mandya, KARNATAKA.	D.E.E.	1 Year	1 Year
16.	Nadiger, D.A.	G.H. Arts, Science College, HAVERI, Dist. Dharwar, KARNATAKA.	D.A. Nadiger, Gururajkrupa, Eastern Extension, Ranibennur, Dist. Dharwar, KARNATAKA.	D.E.E.	2 Years in Kirloskar Asia Switch Gear Con- cern at Bangalore. 1 Year K.E.B. Trainee. 10 Years as self-employed under Entrepreneur Scheme.	3 Years. 1 year as part-time. 2 years as full-time.
17.	M.N.Ramachandra Rao	Lecturer, Acharya Junior College, Gauribidanur, Kolar District, KARNATAKA.	M.N.Ramachandra Rao, Madagonchahalli, Kadanur Post., Doddaballepur TQ., BANGALORE.	B.E. (Elec.)	3 Years	3 Years
18.	G.V.Thippeswamy	Govt. Junior College, Hiriyur-572 143, KARNATAKA.	Gorlukdu K.R. Hally (P), Hiriyur (TQ)-572 143, KARNATAKA.	D.E.E.	2 1/2 years	1 Year
19.	B. Durugappa	B. Durugappa, B.E., Kalpataru Science College, Tiputur, TUMKUR District.	B. Durugappa, C/o.B.Ramachandrappa, K.P.C. Ltd., Magud Colony, Yellapur, N.K. District.	B.E.	4 months	4 months

(1) (2) (3) (4) (5) (6) (7)

20. K.L. Mahabala Rao K.L. Mahabala Rao, D.E.E. 7 Years 6 Years  
Lecturer, Junior College, 197/1, N.M.C. Main Road, M.N.C., Malladi Halli, 577531 Bhadravati-577 303, SHIMOGA.

Holalkere, CHITRADURGA DISTRICT.

21. Kotrayya.G. Vastrad JSS B.A. & Gubbi Science College, Juc Section, Vidya giri, DHARWAR. K.G. Vastrad, S/o.G.G. Mathad, Bengeri Extension, Sidram Nagar, HUBLI-580 023. D.E.E. 5 years Teaching (2 years in I.T.I., Hubli) 3 Years

22. V.F.Koliwad Fulltime Lecturer, in Electrical Engg., Municipal Composite Junior College, Gadag, DHARWAR. V.F. Koliwad, C/o.C.K. Mula Gund, Old Savaf Barur, Harakari Galli, Gadag, Dharmar. B.Sc. B.E. (Elec.) 10 Years 7 Years

23. Basavarajappa V.K! B.L.A. Junior College, Sirigere-577541. Kenchamma, thinulli, Tallogotte (post), Jagalur-577 513. D.E.E., B.E. 2 Years 2 Years

24. Ramesh K.R. Govt. Junior College (Boys), Hunsur, Mysore. S/o. Ramadas, K., Krishna Coffee Works, Santhpet, Periyapettana, MYSORE DISTRICT. D.E.E. 7 Years 7 Years

25. Y.M.Mayi Gowda Smt. Kempacamma Govt. Junior College, Kabbahalli, Gundlupet, (Tq) Mysore District. Y.M. Mayi Gowda, Rajibommanahalli, Melavalli Taluk, Mandya District, KANDLURKA, PIN 571 430. B.E. 2 Years 2 Years

(1)	(2)	(3)	(4)	(5)	(6)	(7)
26.	A.N. Srinatha	A.N. Srinatha, Lecturer in Elec., S/o.A.Narasimhaiah Govt. Junior College, Kunigal-572 130, TUMKUR District.	A.N. Srinatha, S/o.A.Narasimhaiah Satty, LIPTON Representative, Kunigal-572 130, TUMKUR District.	D.E.E.	2 Years	2 Years
27.	K. Nanjundaiah	K. Nanjundaiah, Govt. Junior College, Chamarajanagar, MYSORE DISTRICT.	K. Nanjundaiah, S/o.Chamaiah Kebbahally, Nidesale (P.O.), Kunigal, TUMKUR DISTRICT.	D.E.E.	2 Years	11 Months.
28.	R. Venkatesan	Engineering Instructor, Govt. Higher Secondary School, Ponneri, TAMILNADU-601 204.	No.F. 12, Ramaswamy Reddier Street, Ponneri-601 204.	L.E.E. I.T.D.	28 Years 7 months	28 years 7 months
29.	R. Nandagopal	Engineering Instructor, Govt. Boys Hr.Sec. School, Kallakurichi-606202, S.S. District. TN.	81A, Velanthangal Road, Kallakurichi, PIN 606 202, S.S. District, TAMIL NADU.	L.E.E.	20 Years	20 Years
30.	N. Mariyappan	Engg. Instructor, Govt. Hr. Sec. School, Palli- kondu-635 809, TAMIL NADU.	97, R.S. Nagar, Gudiyattam, PIN 632 602, TAMIL NADU.	L.E.E.	20 Years	20 Years

(2)	(2)	(3)	(4)	(5)	(6)	(7)
31.	R. Rajagopalan	Engg. Instructor, National Higher Secondary School, Mannargudi, TAMILNADU Dist., TAMILNADU-614 001 TAMILNADU-614 012.	23, Haridraathi North Street, Mannargudi, Thanjavur Dist., TAMILNADU. PIN 614 012.	D.E.E. T.T.D.	17 Years	17 Years
32.	S. Muthukrishnan	Vocational Instructor, Viraraghava Hr. Sec. School, Thanjavur-613 009, TAMILNADU.	270, MIG Board, Housing Colony, Pudukottai Road, Thanjavur-613005, TAMILNADU.	L.E.E. T.T.D.	20 Years	20 Years
33.	K. Ramaswamy	Engg. Instructor, Municipal Higher Secondary School, Fort, Salem, PIN 636 001.	50-B, Narayana Nagar, 4th Street, SALEM-636 015, TAMILNADU.	L.E.E.	29 Years	27 Years
34.	R. Vaikunta Raman	Engg. Instructor, Sri K.G.S. Hr. Sec. School, Srivaikuntam, TIRUNELVELI Dt., TAMILNADU-628601	97, West Fort St., Srivaikuntam, Tirunelveli Dt., TAMILNADU, PIN 628 601.	L.M.E.	19 Years 6 months	18 Years
35.	T.S. Sivasakthi	N.M.M. Higher Sec. School, Dindukal, Anna District, TAMILNADU.	44, South Car Street, Dindigul, Anna District, TAMILNADU.	L.E.E. T.T.D.	28 Years	28 Years

(1)	(2)	(3)	(4)	(5)	(6)	(7)
36-	G.F.Govinda Rajan	Govt. Hr. Sec. School, Arantangi, TAMIL NADU.	45C, Gangathara Puram, Arantangi, Pudukottai Dt., TAMIL NADU.	I.T.I.	25 Years	25 Years
37.	V. Nagarajan	Vocational Assistant, National College Hr.Sec.School, TIRUCHIRAPPALLI- 620 002.	2, Srinivasapuram, Thennur, THIRUCHIRAPPALLI- 620 017, TAMIL NADU.	L.E.E.	21 Years	20 Years
38.	V. Murukesan	Training Instructor, Govt.Hr.Sec.School, Kotagiri-643 217, TAMIL NADU.	Shela Vigar, Athikal, (Near INCO 2), Kotagiri-643217, TAMIL NADU.	Diploma in Graftmanship in Automobile	24 Years	24 Years



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- 168  
GUEST LECTURES

Date	Name & Designation of the Guest Lecturer	Subject
1. 27.5.86	Dr. Gopalachar, Asst. Professor, Universal Motors N.I.E. Mysore.	

Motors are briefly divided into two types: 1. D.C. Motors and 2. A.C. Motors. All A.C. motors cannot be used on D.C. supply, except one kind called Universal Motor. Universal motor has construction like D.C. Series motor. Principal differences are the lamination of yoke, field poles and armature, to reduce eddy current and hysteresis losses. Effects of its application both on D.C. and A.C. are same.

Universal motors are high speed and multispeed motors having D.C. series motors characteristic. Current in field and armature are same.

Applications: 1. Hair driers 2. Mixie 3. Egg beaters 4. Vacuum Cleaners, etc.

2. 28.5.86	Mr. Nagendra Swamy, General Manager, District Industries Centre, Mysore.	Services of District Industries Centre to start new Industry.
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Mr. Nagendra Swamy of District Industries Centre, Mysore explained various types of services being rendered by the DIC to start new industry, such as procedures for registration of industries, getting licence and financial assistance from DIC and other agencies. He also explained various schemes sponsored by the DIC for starting new industry, such as TRYSEM, Integrated Rural Development Programme, Rural Artisans Development Programme, Plans for Scheduled Caste, Employment Development Programme, Tribal Self-employment Development Programme, Western Ghat Employment Development Programme and Drought-prone Area Development Programme, etc.

3. 31.5.86	Sri P.G. Sethuraman, Deputy General Manager, Karnataka State Small Scale Industries Dev. Corpn., Mysore.	Assistance given by KSSIDC to new entrepreneurs.
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Mr. P.G. Sethuraman, explained the various activities of KSSIDC. At first they used to erect sheds and give the same to the entrepreneurs on rural basis. Then they changed the scheme and now they are giving the sheds to the entrepreneurs on easy instalment, or hire purchase system. They purchase scarce materials such as coal, coke, iron, etc. and distribute them to the entrepreneurs. They file tenders on behalf of the entrepreneurs thus helping them in marketing their products. They also conduct exhibitions and give technical assistance to new entrepreneurs.

4. 3.6.86	Sri A.R. Rama Rao, Asst. General Manager, BEML, Belavadi Industrial Area, Mysore.	Apprenticeship Training for vocational teachers
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Sri. Rama Rao elaborated on the following points:  
Competencies and behaviours expected of vocational students at the commencement of apprenticeship training, organisation of apprenticeship training of vocational students by BEML, and co-operation between the industry and the school.

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APPENDIX - E

## Visits and Guest Lectures

VISITS

Sl. No.	Date of Visit	Industry/Enterprise/ Place visited	Purpose/particulars of visit
1.	23.5.86	M/s. Kirloskar Elec.Co. Ltd., Belawadi Industrial Area, MYSORE.	Assembling of control panel for speed control of D.C. motors by using Thyristers.
2.	23.5.86	Vijaya Lamps, Industrial Area, MYSORE.	Manufacturing of filaments for lamps of 25W to 200W in different stages from raw tungsten wire including re-drawing, twisting and final testing of the filament.
3.	23.5.86	Krishnaraja Sagar Dam, MYSORE.	To see the display of illumination and working of the electronic musical fountain and also to see the Botanical aspects of the Garden.
4.	30.5.86	Sri K. Seshadri Iyer, Hydro Power Station of Sivasamudram.	To see power generation by using stored hydel energy.
5.	30.5.86	Chamundi Hills, Mysore. / Talakad Temple, Somnathpur Temple, Srirangapatna- Tippu's palace, Ranganatha Temple.	To see places of historical, cultural, architectural and sculptural importance
6.	2.6.86	Mysore Sandal Wood Factory and Mysore Silk Factory.	To see the manufacturing process of two famous industries of Karnataka.

APPENDIX FRecommendations made by the Participants

1. The vocational course in the Repair and Maintenance of Electrical Appliances is a highly useful course, especially, in urban areas. There is, in general, a high demand for this course. It may, therefore, be introduced in more schools in areas having such demand.
2. The course has a good potential for self-employment, which requires high entrepreneurial ability and working competence. The duration of the course may, therefore, be increased by one year. This would also enable the vocational passouts to become eligible for government loans at the age of 18.
3. In all important decisions/actions such as admission, selection or preparation of textbooks, development of instructional materials and conduct of theory and practical examinations at the state, district and school level, vocational teachers must be involved. They should particularly be involved in the setting of question papers and evaluation of answer scripts.
4. The syllabus for the course needs revision on the basis of accumulated experience of vocational teachers and new development in the field. Electrical drawing, which has been deliberately omitted in the A.P. syllabus, is essential for this course and may be reintroduced. The syllabus should also be evenly distributed throughout the course duration.
5. Duration of the semester may be increased from 4 to 5 months to cope with the course content and more periods may be allotted for the teaching of general subjects like language and science.

6. In order to ensure uniformity in teaching and evaluation and to provide academic support to the teachers and students, textbooks for the course as also teachers' guides may be prepared by the states on a priority basis. Also reference books, periodicals and other instructional materials and aids such as demonstration kits, models and charts may be provided to the schools or necessary funds given for this purpose.
7. Essential equipment, tools and materials which are by and large, inadequate at present must be provided to the schools running this course. In the absence of these, teaching and evaluation of this course which is predominantly of a practical nature becomes a farce. Further, provision for its replenishment and updating must be made in case of schools where it were supplied in the beginning. Also, finances may be provided on a recurring basis for the purchase of consumable materials.
8. Visits to industries/enterprises ~~form~~ a very important part of this course. However, such visits are not allowed by many industries for obvious reasons. Industry may be made aware of its responsibility towards vocational education by the State Government through appropriate publicity with the help of mass-media and also by promulgation of necessary orders, by the Industries Department, wherever necessary. Such visits to outside places may be financed by the State Governments at least in case of poor students and T.A./D.A. for the accompanying staff.

9. Vocational teachers teaching this course are by and large untrained in pedagogy. Although, most of them possess polytechnic diplomas in Electrical Engineering, they lack sufficient practical ability. Hence, in-service programmes of both pedagogical and practical training may be organized by the respective State Governments on a regular basis with the help of NCERT, RCEs, CTIs, TTTIs, SCERTs, etc.
10. Apprenticeship training should be provided for all the students passing this course. The Government may extend the Apprenticeship Act and make it obligatory for all public/private enterprises covered under the Factory Act to provide such training. The period of apprenticeship training may be increased to one year. Besides, monthly apprenticeship allowance for the first six months, apprentices should be paid one half of the salary of a regular worker during the latter half of their training. The expenditure on their salary should be shared between the government and the employer.
11. Massive efforts should be made <sup>for the</sup> publicity of this course among the general public and the employing agencies in order to enhance their awareness about it and its popularity. Stipends/scholarships may also be given to meritorious students for attracting the best among them.
12. Recognition of this course may be obtained by the state governments from all concerned agencies for employment purposes. Recruitment rules in concerned government departments and public sector undertakings should be got modified for preferential employment of

dated salary which excludes allowances or increment or both. The salary is also much below that of teachers with comparable qualifications or responsibility and salary is paid often for 9 months only. In addition, part-time teachers who are mostly unemployed electrical diploma holders are employed on an hourly or weekly basis. The plight of such teachers is worse still with very low earnings and no job security whatever. Lack of job security, a decent income, promotional avenues and chances of professional growth are serious hindrances in the effective organisation and teaching of this course. Valuable experience, commitment and dedication cannot grow or accumulate because of the above reasons. It is/strongly recommended that: /therefore,

1. All diploma holders who have put in three years of regular/part-time service as vocational teachers should be made permanent. If the course is closed down in one school, they may be transferred to another school where such a course is started. Or they may be absorbed in concerned government departments dealing with electricity/electrical goods/appliances. The overall demand for services in the field of electrical engineering in the next two decades is bound to increase, rather than decrease.
2. A core of teaching staff i.e. at least two teachers per course may be employed on a permanent basis with uniform scale, allowances and service conditions comparable to those for graduate trained teachers.
3. For practical work only, part-time experts may be employed from government departments, public-sector undertakings, private employment sector and retired persons.
4. Payment of salaries to part-time/full-time vocational teachers should be made regular by simplifying complicated procedures. The rate of payment for part-time experts should be attractive enough to have real experts. A directive may be issued to this effect by the State Governments.

- vocational students in jobs connected with their training.
13. Since the course has a lot of self-employment potential, all state agencies and their district/local counterparts concerned with entrepreneurial/industrial development and employment such as Small Scale Industries Department, District Industrial Development Centres, State Finance Corporations and banks must come forward to help and guide the vocational students in self-employment ventures. A government directive should be issued to this effect and appropriate mechanisms for providing help, should be established.
  14. Efforts should be made by the state governments to study and overcome obstacles in the way of self-employment of vocational students. To enable the vocational students to practise this vocation on their own without having to pass another examination of the State Electricity Inspectorate, recognition of the course may be obtained from the State Electricity Inspectorate after including appropriate content on safety measures in the theory and practical work requirements of the course.
  15. For those students who are unable to engage in employment/self-employment for reasons beyond their control, diploma/degree level vocational courses in the same area may be started. Provision may also be made in the existing polytechnic/technical courses for admission of such students.
  16. The salary, status and working conditions of the vocational teachers of this course are by and large deplorable. Except for the teachers who have been <sup>continued</sup> from the erstwhile bifurcated/diversified courses, all teachers have been employed on a temporary basis with a consoli-





dated salary which excludes allowances or increment or both. The salary is also much below that of teachers with comparable qualifications or responsibility and salary is paid often for 9 months only. In addition, part-time teachers who are mostly unemployed electrical diploma holders are employed on an hourly or weekly basis. The plight of such teachers is worse still with very low earnings and no job security whatever. Lack of job security, a decent income, promotional avenues and chances of professional growth are serious hindrances in the effective organisation and teaching of this course. Valuable experience, commitment and dedication cannot grow or accumulate because of the above reasons. It is, therefore, strongly recommended that:-

1. All diploma holders who have put in three years of regular/part-time service as vocational teachers should be made permanent. If the course is closed down in one school, they may be transferred to another school where such a course is started. Or they may be absorbed in concerned government departments dealing with electricity/electrical goods/appliances. The overall demand for services in the field of electrical engineering in the next two decades is bound to increase, rather than decrease.
2. A core of teaching staff i.e. at least two teachers per course may be employed on a permanent basis with uniform scale, allowances and service conditions comparable to those for graduate trained teachers.
3. For practical work only part-time experts may be employed from government departments, public-sector undertakings, private employment sector and retired persons.
4. Payment of salaries to part-time/full-time vocational teachers should be made regular by simplifying complicated procedures. The rate of payment for part-time experts should be attractive enough to have real experts. A directive may be issued to this effect by the State Government.